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Tuberculosis Case-Finding Techniques in the Province of Ontario

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THE introduction of special miniature film x-ray equipment, which made possible the examination of large numbers of the population with a minimum of effort, at a relatively low cost, supplied the initial impetus for the great expansion of tuberculosis case-finding procedures which has occurred in Canada, the United States and elsewhere during the past several years. Workers concerned with the control of tuberculosis were quick to realize its potentialities and as a result new avenues in the search for unknown cases of pulmonary tuberculosis have been opened up and previous case-finding methods expanded. The dramatic appeal of community x-ray surveys has made a deep impression on the public and never before has there been such widespread interest in the necessity for stamping out tuberculosis. If all the resources now at our disposal are to be utilized to the best advantage it is essential that everyone engaged in controlling tuberculosis, either in an official, professional or voluntary capacity, be fully acquainted with all phases of the program. There is great need for education in the interest of intelligent cooperation on the part of all concerned.

There are two basic objectives in any comprehensive tuberculosis control program, viz., efficient case finding and adequate treatment facilities. Other important aspects, such as education, rehabilitation and economic security, play a significant role but nevertheless must be considered complementary. The problems involved in discovering cases of tuberculosis are so extensive and diversified that no one organization can hope to cope with the situation. The very nature of the official health agency, supported as it is by taxation, limits the scope of its activities. It is, therefore, imperative that the widest possible assistance of the public be solicited on a voluntary basis in order that an adequate service be given. Close cooperation between official and voluntary agencies is

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essential if success is to be achieved. This is only possible if the necessity for teamwork by all parties concerned is fully appreciated. Every worker, whether engaged in an official or voluntary capacity, should make it a point to become acquainted with all phases of the over-all program. The following brief review of the present diagnostic program in Ontario is presented in the hope that it will result in a wider knowledge of the various activities now being carried on.

Prior to 1945 the diagnostic facilities left much to be desired, a condition which became aggravated as a result of wartime problems. While a satisfactory service was being given in the larger, urban centres, there were extensive areas where chest clinic facilities were infrequent or entirely lacking. From clinic headquarters in Fort William, North Bay, Toronto, Belleville, Ottawa and Timmins, the travelling chest clinics of the Provincial Department of Health visited some 15 to 20 centres in each district once or twice a year. This was free to the public, as was the case in a number of other clinics operated by other agencies, but all too frequently the patient was charged an x-ray fee up to $5.00.

To correct this unsatisfactory condition the Ontario Tuberculosis Association was formed in the spring of 1945 and in conjunction with the Ontario Department of Health a program was decided on to provide: (a) free miniature chest x-rays to the general population in community x-ray surveys, and (b) free chest x-rays in referred chest clinics already in operation; and (c) to promote frequent regular chest clinics in every centre where satisfactory hospital x-ray facilities were available.

The organization and financing of this program were of such magnitude that a reorientation of policies governing the operation of the seventeen voluntary tuberculosis associations then in existence was necessary. It was decided to decentralize their activities and form local tuberculosis committees in as many centres as practicable. An organization already active in community welfare work, such as a service club, women's group, etc., was approached in each district with a view to their accepting the responsibility of raising funds annually from the sale of Christmas Seals which would be used for financing the local tuberculosis control program. This was done in the belief that public response would be greater if such a project were carried on as a community effort. The results have amply justified this decision. A total of 107 tuberculosis associations and committees covering the entire province are now actively functioning. In the 1947 Christmas campaign these groups raised $607,000 as compared to $175,000 in 1944, the last year before re-organization.

Mass x-ray surveys, using special miniature film x-ray equipment, were first introduced into Ontario in 1941. Up to the latter part of 1945 this work was confined largely to the examination of adult occupational groups, including school teachers and university and normal-school students. The finding of many unsuspected cases of tuberculosis as well as other significant non-tuberculous chest conditions demonstrated the benefits of this type of case finding. It is of interest to note that approximately 50 per cent of the active cases were found in the minimal stage as compared to 20 to 25 per cent discovered by usual chest clinic methods. The importance of this is evident.

The practicability of mass radiographic methods using miniature films in

the early diagnosis of carcinoma of the lung is receiving increasing attention from various authorities concerned with cancer control. Dr. Russell H. Morgan, Chief of Radiology, Johns Hopkins University, and his associates report that, as a result of 2,000 radiographic studies, miniature films are 95 per cent satisfactory for diagnostic purposes in the early detection of such malignant conditions. In a recent issue of the Journal of the American Medical Association, Dr. E. D. Churchill of Boston states that x-ray screening is the only practicable way to discover lung cancer in the apparently well general population. It is, therefore, apparent that community x-ray surveys, which were introduced primarily to discover tuberculosis, also play a significant role in the campaign to bring cancer under better control.

The organization of the many voluntary tuberculosis associations throughout the Province made it possible to extend mass surveys to the general population on a community basis. Three agencies are now engaged in this program, viz., the Ontario Department of Health, the Gage Institute of the National Sanitarium Association, Toronto, and the Niagara Peninsula Sanatorium, St. Catharines. The Gage Institute confines its activities to the counties of Simcoe and York, including the city of Toronto, in addition to the Districts of Muskoka and Parry Sound; the Niagara Peninsula Sanatorium to the Counties of Lincoln, Welland and Haldimand; while the Department assumes responsibility for the balance of the province.

A brief description of the procedures followed in conducting Departmental surveys will be of interest. The voluntary tuberculosis association concerned undertakes the work of local organization such as canvassing, publicity, secretarial assistance, etc., the Department supplying the special x-ray equipment, technical and medical staff. The miniature chest x-rays are forwarded daily to the headquarters of the Division of Tuberculosis Prevention, Toronto, for processing, interpretation and reporting. Every abnormality of significance is reported to the family physician and the medical officer of health if tuberculosis is present, the individual concerned being notified to consult his doctor. Those cases which require immediate investigation are recalled for examination by a clinician of the Department, a 14″ × 17″ chest x-ray being taken at that time for purposes of more detailed study.

Mass x-ray surveys are free to the public. The local tuberculosis associations pay, out of Christmas Seal funds, a small fee to the Department for each person examined as well as the cost of local organization. As this amount does not cover the entire cost of the service rendered by the Division of Tuberculosis Prevention, the balance is assumed by the Department. In the case of the Gage Institute and the Niagara Peninsula Sanatorium, the x-ray equipment is provided by these agencies, all expenses being paid out of funds raised from the sale of Christmas Seals. Since 1942, over 2,000,000 people have been given miniature chest x-rays in the Province of Ontario and during the past three years some 450 community surveys conducted.

The results of mass x-ray surveys demonstrate that this procedure is an integral part of a well-balanced over-all tuberculosis control program. We are of the opinion that they should be repeated at intervals of four to five years except

in those areas where the incidence of tuberculosis is known to be high, when an interval of two years is recommended.

Since tuberculosis is infectious, its prevention is a public health problem of major importance. It is, therefore, essential that adequate diagnostic facilities be made available for the examination of persons suspected of having tuberculosis, known cases of tuberculosis and their contacts as well as tuberculin reactors in groups known to have a higher incidence of the disease than other sections of the public. The facilities for such investigation should be as easily accessible as possible and the service given on a free basis to the patient. No barrier should be raised which might result in the neglect of certain cases, due either to inability or refusal to pay.

The regular referred chest clinic is the foundation on which an efficient case-finding program must be built. Frequent, regular clinics should be established in every centre where satisfactory x-ray facilities are available. With the co-operation of local tuberculosis associations, chest clinic services have been rapidly expanded throughout the province during the past two years. Many new clinics have been established and others, previously in operation, have increased their activities. At the present time there are 182 regular chest clinics located in 162 different centres. The method of payment for chest films in these clinics, as shown in the following table, is of interest as it illustrates the contribution being made by the voluntary organizations.

	No. of Clinics
Christmas Seal Committees pay entire fee	123
Patients pay fee*	10
Municipalities pay entire fee	2
Provincial Department of Health Travelling Chest Clinics provide free chest x-rays	46
Department of Veterans Affairs—no charge	1

The great increase in the number of chest clinics since 1945 has created certain problems of supervision. Due to shortage of medical staff, many of the new clinics, located chiefly in smaller centres, are operated on an x-ray basis, the films and histories being sent to the nearest sanatorium or chest clinic headquarters for interpretation and reporting. Where the executive branch of the local Board of Health is not organized on a full-time basis, it has been necessary for the district tuberculosis association to provide secretarial assistance to maintain a clinic case register and be present at each clinic to take a short history. While this plan is an improvisation, it is particularly pleasing to note that many of these part-time secretaries display a keen interest in their work and perform their duties in an efficient manner.

The rapid expansion of mass survey procedures, along with widespread publicity as to the necessity of more adequately controlling tuberculosis, resulted in a serious state of overcrowding in a number of the larger urban clinics. Due to the congestion and inevitable confusion, it was impossible for the attending clinician to give proper attention to patients requiring personal investigation.

With a view to ensuring more efficient operation, certain clinics have been divided into two sections, usually held two weeks apart. The first is limited to

*It is expected that in the near future the 10 clinics in which patients now pay will be put on a free basis.

x-raying contacts and certain cases who have been previously recommended to have a repeat chest x-ray for purposes of comparison only. A clinician is not present at this clinic, history-taking being done by a public health nurse. Films and histories are then forwarded to the supervising chest clinic headquarters, those cases showing evidence of new disease being recalled for investigation by the clinic physician at the second section. All cases which require his attention attend this clinic. In those clinics where this plan has been in operation, all parties are agreed that it is a marked improvement over previous methods of operation.

In Sault Ste. Marie, Hamilton, Ottawa, Belleville and Sudbury the local tuberculosis associations have provided miniature film x-ray equipment for use in their respective chest clinics. In the case of Toronto this equipment is limited to the Gage Institute, the cost also being paid out of Christmas Seal funds. These facilities have greatly expanded the scope of the diagnostic service in these centres.

One of the most significant recent advances of the improved tuberculosis case-finding procedure is the program to give a routine chest film to all hospital admissions. As people enter hospital for reasons of illness, a higher incidence of tuberculosis than that found in the general population may be expected. The United States Public Health Service reports this to be twice as much. Approximately 10 per cent of the general population are annually admitted to public hospitals. This large, easily accessible group offers an ideal opportunity for the discovery of unsuspected tuberculosis.

This program is now in operation in a large number of United States public hospitals as well as in a number in Canada. The results have amply demonstrated its value by the discovery of many unsuspected cases of active tuberculosis, thus affording protection against infection to the hospital staff, especially nurses and attendants. In addition, approximately 10 per cent of admissions have been found to have significant non-tuberculous chest conditions, a large majority being previously unknown. The percentage of significant findings in this program is much higher than that found in the universally accepted routine blood count, urinalysis, or blood serology. The benefits of early diagnosis both from the standpoint of the patient and attending physician are evident.

Photo-fluorographic miniature film x-ray equipment similar to that so successfully used in mass x-ray surveys is admirably suited for giving a routine chest film to hospital admissions. Operation is simple and the cost low.

The decision as to whether special x-ray equipment should be installed in a given hospital should be based on the average number of miniature chest films which might be taken, rather than on the number of hospital admissions. This service should not be limited to hospital admissions only but should include other phases of the community tuberculosis diagnostic program.

Various Christmas Seal organizations in the Province quickly realized the potentialities of this new approach to tuberculosis case-finding. As a result, they donated the necessary equipment to their local hospitals and in several instances are paying the hospital miniature film x-ray fee. At the present time there are 12 hospitals located in Brampton, Brantford, Brockville, Kitchener, Galt,

Oshawa, Pembroke, Sarnia, Stratford and Wingham where this program is in operation. Pending the delivery of equipment, routine hospital admission 14″×17″ chest x-rays are being taken at the General Hospital, Wingham. Other tuberculosis associations also have been planning similar projects.

In order to relieve voluntary organizations of heavy financial commitments in connection with the hospital admission chest x-ray program and permit this program to be inaugurated wherever practicable, it has been decided to utilize part of the recent Federal Tuberculosis Grant for the purchase of special miniature film x-ray equipment. This will be given to general hospitals in which investigation shows that such a program can be efficiently operated. By June 1949 it is expected that 60 public general hospitals will be participating.

The wider use of the tuberculin test offers another avenue of approach to developing a comprehensive tuberculosis control program. Different authorities have pointed out its great value as a survey procedure for indicating where possible sources of infection are likely to be found. Its use has been largely limited to certain select groups, such as students, nurses, and contacts of known cases of tuberculosis, with the aim of uncovering tuberculosis among the reactors. Generally speaking, very little has been done by way of a planned program to search out the source of infection among the close contacts of reactors who do not show the presence of disease on chest x-ray.

It would appear highly advantageous to introduce a campaign on a long-term basis in certain selected areas to tuberculin-test the preschool and school population. The reactors and close contacts, especially in the home, would then be given a miniature film chest x-ray. The younger the reactor, the more likely is the source of infection to be found in the family. Besides yielding valuable statistical information, such a program would be a worth-while addition to present case-finding methods, as well as having considerable educational merit.

In the past, considerable confusion has existed due to lack of understanding regarding the proper interpretation of the tuberculin reaction. As public health nurses are frequently required to read the results, it is important that they be thoroughly acquainted with the appearance of a positive reaction. If the intracutaneous procedure is used, induration or oedema, at least 5 mm. in diameter with redness, must be present. In the case of the patch test there must be elevation or vesication which may vary from a single elevation or papule to involvement of the whole test square area. Redness alone in either method is considered negative.

The information and comments offered are given in the hope that they will stimulate interest and discussion regarding the respective methods which could be profitably utilized in an adequate tuberculosis case-finding program.

Industrial Psychiatry

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A PROGRAM of industrial psychiatry might be thought of as a lintel resting on two pillars. One of these pillars is intelligent consideration for the health and welfare of the individuals in the organization concerned; the other is protection of the organization's efficiency. A well-designed arch would have to have a lintel that was not too long or heavy and pillars in height and strength.

The risk that any industry will build up a medical or psychiatric section greater than it requires does not seem to be very threatening, but it might happen. Society urgently needs to be imbued with the principles of mental hygiene in all its parts. Much of men's lives is spent at work, and in industry they come together in organized groups, subject largely to the direction of management. Thus a large part of the population would be accessible to indoctrination with mental hygiene principles if the sympathy of management could be obtained. Nothing is more likely to spoil this opportunity than the over-enthusiasm of uncritical friends.

It is distinctly possible for an industry to be disproportionately concerned about those aspects of psychiatry that are designed to improve immediate profits. For instance, a psychiatrist working for an industrial company might only be instructed to prevent, as far as he could, the hiring of any employees who were likely to present personality problems and to facilitate the discharge of those who displayed any psychiatric symptoms.

A well-designed psychiatric program in an industry should assist in the selection and transferring of employees and sometimes in the recognition and discharge of workers who are unadjustable, but that function should not be regarded as its main one.

Fads and fashions in charlatanry vary, and just now seems to be the heyday of pseudo-psychology. The line between legitimate vocational guidance and the undiscriminating use of shot-gun "vocational tests" which are not nearly so scientific as they look, should be watched closely. Tests properly and conservatively used are of great value. This is particularly true of intelligence tests. A psychiatrist, or a plant medical director interested in mental hygiene, should work in close relationship with the personnel staff and should have a voice in the formulation of their policies. He might sometimes have occasion to try to modify their enthusiasm for tests and questionnaires and

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for rejecting applicants for employment who seem at all questionable. Dershimer, reporting on his experience as a psychiatrist working with the Du Pont Company, questions the wisdom of over-emphasizing screening and placement. He says that it is surprising to find that individuals who fit into every known psychiatric category often turn out to be excellent workmen (1).

Where the term psychiatrist is used in this discussion, it is largely a matter of convenience. Generally what is meant is "industrial physician interested in mental hygiene". A very large company with a medical department including several doctors could make use of the services of a full-time psychiatrist who would direct the program and act as consultant. This has been done, for instance, by the Metropolitan Life Insurance Company since 1922. It would probably be more practical, however, thinking of the general industrial picture, to plan that the day-by-day work should be done by industrial physicians who had received some superficial training in psychiatry and were interested in mental hygiene. It seems reasonable to anticipate that provincial health departments, in their industrial medicine divisions, may some day provide psychiatric consultation services for industrial physicians.

Himler (2) draws attention to the value of a brief superficial appraisal of the applicant's personality during his pre-employment medical examination. He describes four groups whose members made up a small percentage of the applicants, but who contributed a large proportion of absenteeism, friction with fellow employees, minor accidents and infractions of shop rules. Notes were made on their records at the time of employment, and they were followed up for two years. The groups were: (1) those showing distinctly negative personality traits (arrogant, distrustful, resentful, smart aleck, etc.), (2) those with indications of mental disorder or defect, (3) those with neurotic tendencies (presumably pretty marked ones!), and (4) miscellaneous characterizations (perfumed, quiet, self-assured, talkative). Certainly a moderate amount of weeding out would seem wise, but Dershimer's optimism about the feasibility of finding places in industry for the psychiatrically handicapped deserves more emphasis.

In addition to guarding against the employment of psychiatrically unsuitable people and assisting in their elimination from the ranks, there are other ways in which psychiatry could directly support the interests of an organization. Teaching foremen and supervisors a little of the psychology of leadership and morale is one very important contribution.

Dershimer (1) emphasizes the "genuine preventive psychiatry" that can be done by giving men in authority some insight into the way their own attitudes and methods of handling their own emotions have affected their relationships with subordinates.

Morale can be improved by providing good channels of communication up and down the line between worker and management, eliminating sources of irritation and giving employees a voice in the development of policies. Reduction of grievances requires the reduction of emotional clashes between individuals. Those who are in positions of authority can be trained to pay

more attention to the effects of their attitudes on the feelings of their subordinates.

Subordinates and people in positions of authority frequently display attitudes that tend to aggravate rather than to minimize friction. These attitudes may be the outcome of such influences as a belief in the sanctity of arbitrary discipline and unquestioning obedience. There are certainly a great many people in this age who resent that sort of discipline. For another example, supervisors often seek prestige by being unnecessarily secretive about their "inside information", to the annoyance of their workmen whose cooperation could be improved if policies and plans were discussed with them. Topics such as methods of discipline, the effects of insecurity on leadership ability, the emotional needs of human nature, and many other similar ones, could be used in an educational program for foremen and supervisors.

The preservation of our social structure requires a greater degree of solidarity amongst the groups and classes that make it up. Some of the most serious of the present-day clashes occur between labour and management. The picnics and slogans and other "propaganda stunts" sometimes employed to improve the team spirit in companies are so blatant and superficial that they must arouse more suspicion than enthusiasm in the minds of all but the most gullible workmen. To have enduring morale in any social unit, the followers must have confidence in the integrity of their leaders, and agree with the purposes and policies of the organization. Applied to industry, this would mean that workmen would have to have faith that the work of their company was socially useful and that the company would respect them as human beings and keep faith with them. Assuming that a company comes up to that moral standard, it should be possible, with good leadership, to convince employees that they do so. Policies and administrative methods would, however, have to be continuously scrutinized with regard to their possible effect on morale.

In this connection, one who was trained to think of the instinctual needs, and defensive mental mechanisms, and suggestibility, of human beings might bring a very wholesome point of view to the policy-making councils of an organization. He might often be able to point out to executives, whose opinions were somewhat circumscribed by the limited realities of bookkeeping and administrative procedures, the remote, unwholesome, human, implications of some of their decisions.

Psychiatrists with experience in industry regard their most important function as advising management about questions having to do with human relationships, human needs, and morale.

The other pillar supporting the program, direct assistance to the employees, also of course, indirectly, supports the interests of the organization. A good state of mental health and a good adjustment to life favour effective production.

This work with individual cases will fall naturally under a few headings. There will be cases of psychosis and severe psychoneurosis to be recognized, tentatively diagnosed, and referred to community psychiatrists for treatment. Explaining the attitudes and limitations of employees to their

supervisors may often make it possible to keep a psychiatric patient at work, when without this interpretation he would have been discharged, or placed on sick leave. There must be a great deal of room for interpretation of working conditions to private physicians also. Dershimer (1) refers to the "fixed habit of many uninformed practising physicians and surgeons, including some psychiatrists, of advising all 'nervous' patients to take time off." By doing so, he claims, and most psychiatrists would support him, that they help to turn people with mild psychoneurotic tendencies into chronic cases.

Psychiatric illnesses play a very large part in the loss of time from work, and their proper recognition and treatment and rehabilitation are major medical responsibilities, even when only a narrow view of medical responsibility is taken. A survey was made in England between 1942 and 1944 of the incidence of neurosis amongst factory workers, its effects on production, and the predisposing factors (4). This study showed that neurotic illness caused from a quarter to a third of all absence from work due to illness and from a fifth to a fourth of all absence due to any cause.

A study of psychiatric illness in coal miners in England (3) showed that occupational factors were absent or unimportant in more than half the cases: only a few broke down on account of the dangerous or unpleasant aspects of the work. Deep-seated personality factors eclipsed the occupational factors in importance.

In addition to the clear-cut psychiatric cases which have the same claim on an industrial health service as do any other types of illness, and which demand a great deal of attention, because of their frequency there is in any large organization an opportunity to do a great deal of "psychiatric first-aid". Some examples of what is implied by this term can be briefly suggested.

There are very likely to be emotional complications with most illnesses or injuries; they can often be minimized by careful explanation when the patient's personality and circumstances are understood, even superficially. A man seen recently had built up a severe anxiety state with dyspepsia in this way: He felt tense working under a very arbitrary boss as an apprentice upholsterer, he developed symptoms of functional dyspepsia and somehow elaborated the theory that the "nerves in his stomach" had been damaged by the iron from the tacks—so he gave up his training and placed himself in a very insecure position. There were more deep-seated causes for his anxiety than the immediate precipitating ones, but his general attitude was good, he was biddable and with early explanation and reassurance and a chance to ventilate his feelings about his boss, he could probably have been relieved of symptoms and persuaded to complete the course of training he had started. Very often erroneous theories can be corrected before they have served as foundations for elaborate superstructures. Afterwards they are awfully hard to eradicate. The confusion of the psychological and anatomical meanings of the word "nerves" is one of the most noxious weeds in the whole crop. Doctors certainly help to scatter its seeds.

Another type of case in which symptoms due to psychoneurotic mechanisms are likely to be relieved by superficial treatment is that in which a man who is not very adaptable, is disturbed by a change in routine, or by

promotion to responsibilities that are too heavy for him, or as a result of being driven by a new boss who doesn't understand him. If symptoms are related to causes of that order, then aspirin and stomach powders and sick leave are not going to be of much value. They can do a great deal of harm by reinforcing the patient's belief that the trouble has a physical origin. Psychiatrists sometimes refer to iatrogenic diseases, meaning diseases caused by doctors. Discovering the causes and meaning of the symptoms, explaining them with reassurance, avoiding the glib explanation that they are "just due to nerves", and making adjustments in the work situation, will generally bring good results.

In addition to symptoms which are the elaboration and accentuation and prolongation of physical disabilities, and symptoms which are due to physiological disturbances secondary to anxiety, psychiatric first-aid would have to sort out the symptoms that appear to be definitely in the mental sphere. The patients will explain that their "nerves are all shot"—or that they are on the "verge of a nervous breakdown". That verge must be a delightful place in some ways, a sort of bargaining position between two worlds. Or else, showing a little more insight, they may say that they are blue and irritable and worried. These cases might be placed in three groups: those whose symptoms were obviously severe enough to demand that they be referred for psychiatric treatment; those who responded quickly to explanation and reassurance and adjustment of some difficulty associated with their work, and those whose prognosis and final disposal would have to be held in abeyance while their response to superficial treatment was observed. None of them should be put off or told to "forget it" until the nature of his difficulties has been pretty well understood by careful inquiry and observation. It is very harmful to adopt a disparaging attitude to the neurotic. They feel that they are inadequate in the face of some of life's problems anyway or they wouldn't be neurotic, and for a physician to give them the impression that he looks down on them is certainly contrary to the spirit of medical ethics. It is a gratuitous insult to tell them that their troubles are imaginary when they have come seeking help.

The common method in medical practice is to seek an answer to the question: What disease can be causing these complaints and symptoms? In cases where these are not due to disease entities, but rather to difficulties in the patient's inner life or situation, this time-saving approach must be modified. The questions now are: What sort of man is this? and what is happening to him to give him distress? In a superficial examination into a psychiatric problem, conducted let us say on the level of general practice, it is easy to get a good approximate idea of the kind of patient you are dealing with and what is bothering him. It requires time and that is one of the main difficulties; it also requires a change from the usual style of using direct and leading questions. Ask the patient about his family, about his childhood, about his recreation, and about his work. Give him his head when he wants to enlarge on something, find out why he did this or that, why he changed jobs, why he believed in being a "lone wolf", what he means by saying he is "nervous", or "can't stand" certain things. You can fairly readily acquire an under-

standing of his intelligence, self-confidence, tendency to assume or evade responsibility, traits of submissiveness, aggressiveness and such like. That is the longitudinal section of his life history. A rapid examination of the present cross-section should give at least valid clues about what is troubling him. There is nothing mysterious or particularly difficult in this sort of superficial psychiatric examination. It requires time, and the doctor has to modify somewhat his usual authoritative style and train himself to be a sympathetic listener.

This sort of examination often brings good therapeutic results as well as information. The patient is being given a chance to air his views and to get his difficulties arranged so that he can see them in perspective. There is some emotional release, or catharsis, that goes with pouring his troubles into understanding ears. The doctor can also unobtrusively offer explanations, correct errors, give reassurance and, feeling his way along as he gains insight into the case, employ a little direct suggestion.

It is often in circumstances at home rather than in laboratory and radiographic reports that the answer to symptoms will be found. Many a man has left a job saying it was too heavy for him when the burden that was making his back ache was family troubles. Frequently a sympathetic hearing, correct information and prognosis in medical problems, and encouragement will effectively modify psychoneurotic symptoms and check their terrible tendency to gather increasing significance. If they are allowed or encouraged to go on, they become more serious, as a snowball rolling down hill becomes bigger.

Men can often be helped, when problems presented at work are really caused elsewhere, by referral to social agencies, and by consultations with private physicians. Sometimes advice about a recreational program may be indicated; sometimes the thing to do may be to send them to someone who can advise them about budgetting and financial problems. Worries about children may be relieved by the assistance of a child welfare agency; a family welfare agency may be able to help with marital problems.

People need more than safe and sanitary working conditions and financial security. They need as well opportunities for self-expression, and they need to feel that they have some personal significance and social recognition, and that they are associated with organizations whose aims and methods they admire.

Industry should regard itself as being concerned with two kinds of output —the goods or services it supplies to society, and the human satisfactions it provides for those who work in it.

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Methods and Materials in School Health Education

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THE TITLE of this paper suggests classroom instruction, perhaps a discussion at a teachers' convention. But we are not teachers, nor are we frequently called on to give classroom instruction. Once in a while we may have occasion to visit a school between nine and four, and a courteous teacher may ask us if we would like to speak to the boys and girls, and we are supposed to have a few well-chosen words to deliver. For most of the school year, however, the responsibility for health education is carried by the teacher. It would seem, therefore, that the practical thing is to consider what we, as public health workers, can do to help or stimulate teachers. Our problem is to work out methods of working with teachers and school boards, and finding materials which can be put in the hands of those who will be giving the instruction.

The attitude of health department personnel to members of the teaching profession can hardly be classed as either method or material in health education, and yet there is probably nothing (except our attitude to the pupils) which is more important in dealing with school health. It is of the utmost importance that we appreciate the teacher's job before expecting her to be filled with missionary zeal for carrying out our ideas.

Let us remind ourselves that we ask an enormous amount of teachers. Imagine a teacher in front of her class on a Monday morning, or the first day of the term, or any of those times when a vista of hope and opportunity is supposed to be stretching out before the pupils and teachers. No doubt these occasions are rich in opportunity, but they have other features also. In front of her are from twenty to forty students, and they are dull, average, and brilliant. She is expected, along with other teachers who will be encountered along the way, to "fit them for life"—a fearful and wonderful assignment! It means that each year or week or day the pedagogue is supposed to judge with reasonable accuracy what portion of instruction will merge into what some day could be considered an adequate education.

What is involved in this adequate education? To begin with, there are the three R's. The pupils are supposed to have sufficient dexterity with numbers to be able, on leaving school, to deal with their income tax and other forms of simple arithmetic. They must write legibly, and they must be able to read not only swiftly but intelligently on matters pertaining to politics, local, provincial, national and

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international. They must have some skill in spelling, and they must know a bit about geography and history. It would not do, either, for graduates of our schools not to know enough about science to have a working idea of the principles involved in atomic energy.

These are just the bare essentials. If he is not to be a boor, he must know something of art and music. He must also understand what makes society function—why the prices of butter, eggs and milk seem always to be going up when he is buying them but down if he is selling. He must know hundreds of community rules, varying in seriousness from those based on the Ten Commandments to those prohibiting him from going through stop lights on his bicycle.

It goes without saying that the boys and girls are to be turned out ready to take a job or to take intensive training for one. The Dominion Bureau of Statistics codes something over 200 occupations which are broken down into over 1,200 job classifications, and these in turn have a further breakdown into thousands of jobs. By some miracle of divination the school is supposed to arrive at the greatest common denominator of information for the workaday world of many jobs and to fit the dull, the average and the brilliant into it.

You might think that this was about enough, but no—along come those who want boys and girls to emerge from the school system with sufficient knowledge and understanding of others to tolerate opinions which they do not share, be they held by a political opponent or one who differs in religion, nationality or race.

Then we health workers step up with our requests. We want the teachers to entice the pupils into eating habits that will result in good health, in habits of cleanliness that will protect both the individual and the community, in so far as it is possible, from communicable disease. Just as a side line, the teacher is to keep records on growth and development and report abnormalities to someone in the health department. She is to be alert to note symptoms of eye strain, poor hearing, adenoids, skin conditions and other ills. Finally, she is to guide them to adopt a sensible, well-balanced attitude to life, with sufficient respect for the integrity of others and themselves to make them helpful and happy all their lives.

These demands we make of a group thousands of whom have had only one year of professional training after high school. Some have not been able to complete high school. Don't think that I am overlooking the mounting number of exceedingly highly trained teachers, or am not conscious that their numbers are growing. But, highly trained or sketchily trained, they have an enormous job. I may seem to have dwelt on it for a great length of time, but I feel that it is fundamental to our approach to the school personnel that we should appreciate the difficulties and burdens of the teacher's position. We should be acutely aware that we are asking busy people to do something which, for the moment at least, adds to their work or requires some special effort. It is true that we believe that, if their pupils are healthier, the teacher's work will go better and the effect will be more lasting. In the meantime, let us keep at the front of our consciousness the fact that they are a group of whom almost impossible things are asked. No matter which member of the health department is working with teachers, he or she should never forget that we are asking help of very hard-worked people.

There are three general lines on which we can work from the outside to improve school health programs. We can make a consistent attempt to improve the quality of the instruction by helping the teachers to get a better mastery of their subject. A second way is to improve the health of the school children by physical inspection followed by correction of defects. A third approach is to improve the environment in which the child spends his school hours. Sometimes these overlap. Probably you have seen school lunch programs which helped in all these directions because the teacher learned something new about nutrition and this gave her ideas about lessons. Simultaneously, the hot lunch improved the health of the children because they ate more wisely, and the school board, because of the luncheon program, improved the hand-washing facilities.

The remainder of this paper will be devoted to brief accounts of methods that have been tried by health departments, local and provincial, to promote better health in the schools, using the three methods already mentioned.

One way in which several provincial departments have tried to improve the quality of classroom instruction is by providing teachers with a list of health reference books, free pamphlets, and films that are available through the department of health, and inviting the teachers to use this service. The Province of Saskatchewan, for example, distributes a letter telling of the service, a list of books and another of films, with a description of their length and the topic with which they deal. There is also a form for the teacher to fill in, indicating which films she wants and when she wants them. When the request reaches the department, arrangements are made to comply with it and a form card notifies the teacher when the film will be mailed and how long it may be held.

This service takes somebody's time for cataloguing and arranging, but once this is done, the department can reach more persons with fewer staff members than in most other ways.

An experiment in improving health instruction which was tried out in Alberta last year was sufficiently unique to merit some detail in description.

The Department of Education was persuaded by one of the health officers to give credit towards a Bachelor of Education degree to students who would take a really serious summer course in community and school health. The course was called Constructive Medicine. When it was offered, it was suggested that school boards give their teachers summer scholarships of fifty dollars to help defray the cost of board, room and tuition. Thirteen school boards furnished teachers with these scholarships.

The course, given at the University of Alberta, was handled by the tutorial rather than the lecture method. The discussion method was chosen because it gave the students practice in the methods they were expected to employ when they went out to their districts. The class was divided so that two or three persons were responsible for leading the discussion each day. The representative of the Health Department or the staff of the College of Education never acted as leader of the group. The one who was an authority on the topic of discussion for the day was present, but only to see that there were no mistakes in subject matter; he contributed, but did not lead. This was a matter of policy.

The list of reading was extensive, and each day the students in charge took the responsibility of bringing out opinion from their classmates, of getting opinions expressed; in short, they used adult education techniques. In the afternoons there were field trips, conducted by members of the staff of the Department of Health.

The opinion of the students was that they had never worked as hard on a course before, but neither had they ever received as much benefit. Their letters, during the winter months, said how useful the course had been and were most appreciative. Public interest is indicated by the fact that school districts adjacent to those where these teachers were working had asked if they could "borrow" the teacher who had taken the course, to get study groups organized in their districts. One would expect that these trustees would be prepared to underwrite a similar course for their own teachers if the course is offered again.

Nurses working in rural areas may be interested in what was done by a public health nurse in New Brunswick. Her territory is large and well-populated for a rural area. There are a great many schools and school teachers. The school superintendent in the district is a great advocate of in-service training, and his teachers have one Friday afternoon a month for a meeting—really a brief institute—where they work out better ways of doing their work. There are, also, institutes held in the fall.

The superintendent of schools and the public health nurse worked out a course in health education for the teachers. The nurse began with a discussion of the signs and symptoms which would be grounds for asking the nurse to pay the school or one of the homes a visit. The teachers proved apt pupils. The nurse reported that they were quick to learn the techniques of observation and that she had not once been called needlessly during the year. Because of the frequent conferences, the teachers consider her one of themselves, and her entry to the schools is therefore easy and natural.

Another project in teacher-health department joint effort should be mentioned. This took place in Manitoba in one of the local health units in which there is a health educator.

One of the first tasks assigned the health educator by the medical health officer was arranging a series of teacher conferences in the health unit.

The first step was to confer with the public health nurses of the area to discuss the most urgent problems. The list included: too many soft drinks, handwashing neglected by pupils and not always insisted on by a busy teacher, failure to test eyes, failure to report communicable disease, pediculosis, and classroom temperatures. The object of making this list was to prevent delay in arriving at the meat of the problem when the health department staff met the inspectors. It would take too long to go through the arrangements for a meeting of inspectors, discussion of the various points at this meeting, and decision on the order in which subject material should be considered and which films were to be shown to the teachers. It took a great deal of time, but the conferences were arranged and three have been held, very successfully, despite the fact that the teachers have to attend them on their own time.

Now let us change to the subject of improving the health of the school child through better medical inspection. Let us review the part played by a public health nurse in an area where this approach was used.

First the nurse and the medical health officer decided how many schools could be inspected in a given time and picked the schools and decided the order in which they were to be done.

A week before the children of a school were to be examined, the nurse visited the school to confer with the teacher. She did the height and weight records, getting as much help as possible from the senior pupils so as to get them interested and thinking about such things. She filled in the record of what communicable diseases the children had had, and similar information.

Her next step was to visit the homes and invite the parents (usually it was the mothers) to be present at the consultation on their child or children, arranging as nearly as she could the approximate time for the various mothers to turn up at the school.

When she arrived at the school, she was ready for work, with her equipment. She helped with the inspection and was present when the doctor discussed with the parents any particular feature needing attention. If the teacher was not free to be at this interview, and the points discussed were ones she should know, the nurse saw to it that she received this information. The nurse also conferred with the teacher on any classroom adjustments that should be made.

Finally, she came back sometime in the next few weeks to see if the corrections suggested had been taken seriously—if the teeth were being filled, the tonsils removed, or the glasses purchased and, if purchased, being worn. If the matter in question was being neglected, she paid another visit, or even two visits.

By the time all this had been done, the nurse was on friendly terms not only with the teacher but also with many of the parents. Many of the parents and the teachers in the schools examined knew the health officer and had discussed matters of mutual interest with him. Naturally these people were much more ready than they had been before to go to the local health office or to call up the medical health officer if occasion arose. The nurse who told of this particular project said that a great many of the teachers would make some comment such as, "If I'd just known at the beginning of my teaching career a few more of these things." Well, better late than never.

Now let's look at the machinery of a school lunch program, a project which can be expected to help along the line of instruction, individual health and improvement of the environment.

I was in New Brunswick at the time they were doing the spade work on a school lunch program and was back a bit later when they began to see the results. I think those of you who may be planning to initiate such a program might be interested in their methods.

The over-all program was planned by the Provincial School Lunch Committee, a part of the Provincial Nutrition Committee. This committee had representation from the Provincial Nutrition Committee, the Provincial Health Department, the Canadian Red Cross Society, and the Department of Education.

After the committee had picked out the counties with the most interest in nutrition, the provincial nutritionist worked in these counties stimulating interest in school lunch programs.

With this preliminary work done, the director of child welfare contacted the county superintendent of schools and the superintendent of public health nurses in the area (or the public health nurse, if there was just one), and it was decided that the plan would be discussed at the Regional Teachers' Conference held prior to the opening of schools.

In August both the director and the nutritionist attended numerous teachers' meetings and talked about the matter to teachers. In October the nutritionist and the public health nurse went to the schools which seemed the likeliest prospects and generally managed to sell the idea to the teachers and the trustees.

The nutritionist undertook the task of determining what equipment would be needed, did the purchasing, and saw that the equipment was actually delivered, frequently taking it to the school herself, and helping with the installation. This may seem like turning the nutritionist into a clerical staff-cum trucking machine, but it is by such adjustments that programs get under way. Very often a school lunch program has withered without flowering because nobody tended to the chore of getting the equipment from the seller to the consumer. The delivery of the equipment gave the nutritionist another chance to visit the school and encourage the teacher along the path of better nutrition, furnishing her with material that would prove usable in lessons.

This took until about the end of November, when road difficulties interfered with visits to the schools. During this period when visits were impractical the teachers received circular letters making suggestions of various kinds.

From February to April the nutritionist again visited the schools to see the program in action and give help wherever possible.

In March a questionnaire was sent. Its twenty-five questions were calculated not only to find out how the program was going but to act as a reminder to the teacher of the opportunities the lunch program offers for lesson material, for getting handwashing established as a regular habit, and for raising the standard of cleanliness. The questionnaire asked the teacher to evaluate the benefits of the program. Of those who had tried it, 99 per cent said that it was definitely part of the health program, 73 per cent reported an improvement in the school lunches, and 90 per cent said that the children had increased in neatness and were more ready to assume responsibility in connection with the lunch program. These and many of the other answers indicate, I think, that as a school health project fostered by the health department, it has been a success.

There remains the matter of improving the school environment. The report of the National Committee for School Health Research, under the direction of Dr. A. J. Phillips, shows in black and white how much that environment needs attention. The public health nurse may be the one who takes the initiative here as well as in other places, but it is a field where sanitarians have sometimes been able to do a great deal.

There are certain advantages to approaching school health through the environment. One is that people are induced to use improved facilities, and once

a forward step is taken by the majority of the human race it is only with the greatest reluctance that it will be dropped. Once something becomes an accepted part of our standard of living, we will apply a lot of pressure rather than drop it. It is true that not all children take to cleanliness like ducks to water, and there may even be some of us here who protested violently against being scrubbed when young; but we have lived to consider a bathroom for our exclusive use one of life's more desirable luxuries. If the washing facilities at a school are such that a child can wash in warm water and soap instead of cold water without soap, it won't be long before he will be washing in warm water at home. If clean toilets are insisted on in the schools, it will be only a short time before the children revolt against dirty toilets anywhere. If the sanitarian explains to the trustees the need for clean wells in the school, some of the trustees will turn critical attention to the wells from which they drink at home.

Sanitarians are good educators, once they get under way. They deal with concrete things and this has a tendency to lead them away from the abstractions and technical terms which sometimes play too great a part in our conversation with laymen.

If possible, get the sanitarians on your staff to visit the schools when the children are out at recess, and encourage them to talk with the older students. If possible, have some forms to be filled in at each school, and don't hesitate to let the pupils see them. If they ask the why and wherefore of various items, by all means let it be explained to them. A lot of very good health education has been done by getting teen-age pupils to do surveys of the sanitary conditions in their schools, with or without comparison with other schools.

After five years of study, detailed forms have been worked out by public health engineers for use in schools in Michigan. They are designed to cover everything from a one-roomed school to large, well-equipped, consolidated schools. They are therefore more complex and searching than would be needed in many of your areas, but they will give you an idea of what an excellent teaching aid a form can be.

An ideal thing would be to launch a school health program along all three lines—classroom instruction, pupils' health, and an improved environment. If there is the staff to do it, then by all means advance on all fronts, and more power to you. Most of us are limited by staff shortages, but that should not stop us, or be given as a reason for delay in starting. There will be obstacles, but go ahead. You will clear some of them out of the way. You will get farther than you think, and three or four years later you will find that school health standards in your area have improved more than you had expected.

A Note on Trichinosis in Animals of the Canadian Northwest Territories

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IN the course of work with the natives of Southampton Island, N.W.T., during the summer of 1947, stories of previous illnesses were obtained which were highly suggestive of trichinosis, and a high incidence of marked eosinophilia was discovered (1). For these reasons an attempt was made in 1948 to determine the source of the human infection, and the present communication is concerned with the results of the examination of specimens of various animals. The matter of the human infection was also gone into thoroughly and the results of this study, which disclosed unequivocal evidence of *Trichinella* infection among the natives, will be reported later.

Between the middle of July and the first week of September 1948, specimens of diaphragm, masseter and other muscles were collected from five species of animals. These included the square flipper seal (*Erignathus barbatus*), the jar seal (*Phoca hispida*), the harp seal (*Phoca groenlandica*), the walrus (*Odobaenus rosmarus*), the white whale (*Delphinapterus leucas*), and the polar bear (*Thalarctos maritimus*). The walrus were killed by natives off the shore of Bencas Island, 100 miles south of Southampton Island. The other animals were killed on or close to the southern shore of Southampton Island.

The specimens were preserved in 10 per cent formalin and were later examined by the following method. Pieces of muscle were frozen and thin longitudinal sections cut. These were either cleared in an aqueous 10 per cent solution of lactic or acetic acid or were dehydrated in alcohol and cleared in carbol-xylol. To make the parasites easily detectable, acid fuchsin was added to the clearing solution. The muscle was then examined in the trichina compressor both under a dissecting microscope and under the low power of an ordinary microscope. Approximately 10 to 15 grams of muscle were examined from each animal.

There were specimens from 6 seals, 7 walrus, 9 whales and 3 polar bears. Two of the three polar bears were infected with *Trichinella spiralis*. In both cases the degree of infection was light. One bear contained about one larva per gram of muscle and the other about eight. The parasite was not found in the muscles of the third bear or in those of the other animals.

Discussion

There are not many references to trichinosis in polar bears to be found in primary source material, and for the most part the reports concern polar bears kept in zoological gardens. Parnell (2) stated that he found *T. spiralis* in arctic

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foxes and polar bears but did not give the particular locality in which specimens were collected. Leiper (3) reported that post-mortem examinations of four polar bears from the Zoological Gardens in London disclosed the infection and concluded that in all probability it had been acquired in the Arctic rather than in London. Moreover, the bears in the London Gardens were fed chiefly on horse meat. Leiper also found that two arctic foxes which died in the Gardens were infected with *T. spiralis*. Ratcliffe (4) has reported that over a period of time he has autopsied seven polar bears at the Philadelphia Zoo, and that six showed trichinosis.

Thorborg, Tulinius and Roth (5) have described a series of outbreaks of trichinosis in the spring of 1947 at Disko Bay in western Greenland and concluded that an epidemic in 1944 reported as typhoid and a previous epidemic in 1933 reported as food poisoning were undoubtedly trichinosis. In the 1947 outbreaks, which involved about 300 persons with a mortality of 10 per cent, pork was excluded as the source of infection and the suggestion was made that it might have been the walrus, the dog or perhaps the white whale. These authors (6) reported a high incidence of trichinosis in sledge dogs and polar bears; 41 of 54 dogs and 6 of 16 polar bears examined were infected. They also found *Trichinella* larvae in one bearded seal (*Erignathus barbatus*). Recently it has come to light that an outbreak occurred in 1944 in a group of Germans who had established a weather station in Franz Josef Land (7). The attacks followed the eating of polar bear meat infected with *T. spiralis*. This led to the examination at the Norwegian Veterinary Institute of specimens of seven polar bears obtained at Svalbard. All of them were infected with *T. spiralis*.

The source of infection for the polar bear remains conjectural and can be identified only by further examination of arctic animals which serve as food for the polar bear. The fact that *Trichinella* infection has been demonstrated in the bear should be known to parties travelling or at work in the north and the danger of eating inadequately cooked polar-bear meat realized. For the Eskimo it constitutes a real problem. He has to eat what is at hand, and if he is in a hurry or if fuel is in short supply, he will eat it raw. The results of this combination of necessity and habit were distressingly evident during our work in 1948, and there is no easy solution, for though he will change his habits on advice, advice will not change his occasional necessity.

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Letter from Great Britain

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SOCIAL MEDICINE IN GREAT BRITAIN

FOR a hundred years the branch of medicine which concerns itself with the health of society, rather than with that of the individual, has been forced to live and develop away from the teaching centres; it has had its great men, its Southwood Smiths, Farrs, Newsomes, Newmans and Ryles, who have developed its various branches and its own peculiar pathology; it has achieved so much that the face of England has been completely changed by its activities and the teaching hospitals themselves affected through a changing individual pathology which has resulted from its successes. Yet it has been ostracised and those who have left the ranks of the clinicians to enter public health have been regarded with a mixture of pity and scorn. Sir Arthur McNalty, one time Chief Medical Officer, Ministry of Health, in his fourth Fitzpatrick lecture on the History of State Medicine in England (1948), said: "At the beginning of the 20th century an unfortunate gulf had arisen between the medical officers of health and the practitioners of medicine .... Young men of promise and ability were discouraged by their teachers in the medical schools from adopting public health as their life work .... public health was regarded as an 'affair of stinks and drains' and, it is to be feared, as an inferior brand of medicine designed for men of mediocre parts."

It is idle now to contemplate why this misunderstanding has been allowed to reach such a ripe old age. Some feel that the conflict is due to the independent growth of 'Public Health' but this hypothesis overlooks the fact that public health developed independently largely because clinical medicine failed to broaden its outlook to meet a changing world. Ryle, in his 'Changing Disciplines' (Oxford University Press 1948), says of this—

> "Thirty years of my life have been spent as a student and teacher of clinical medicine. In these thirty years I have watched disease in the ward being studied more and more thoroughly—if not always more thoughtfully—through the high power of the microscope; disease in man being investigated by more and more elaborate techniques and, on the whole, more and more mechanically. Man, as a person and a member of a family and of much larger social groups, with his health and sickness intimately bound up with the conditions of his life and work—in the home, the mine, the factory, the shop, at sea, or on the land—and with

his economic opportunity, has been inadequately considered in this period by the clinical teacher and hospital research worker. The medicine of the teaching schools has, as I have suggested, undergone a gradual conversion to a highly technical exercise in bedside pathology and therapeutic method. The morbid 'material' of the hospital ward consists very largely—if we exclude the emergencies—of end-result conditions for which, as a rule, only a limited amount of relief repays the long stay, the patient investigation, and the anxious expectancy of the sick man or woman. With aetiology—the first essential for prevention—and with prevention itself the majority of physicians and surgeons have curiously little concern. Nor have they at present the opportunity, nor yet the appropriate types of training or assistance, requisite for the study of aetiology or prevention. Their material is mainly selected by four factors; the gravity, the difficulty or the rarity of their cases, or their suitability otherwise for admission to a hospital. Some of the most common diseases, the less lethal diseases, and the beginnings of disease are even considered as providing 'poor teaching material'. Health and sickness in the population and their possible correlations with significant and measurable social or occupational influences are outside their province."

No; the world of clinical medicine cannot blame 'Public Health' for the present situation. 'Public Health' hastened to make up for the deficiencies of the parent body. But the time has come for differences to be resolved. It is probable that the very success of public health helped to strengthen the barriers, largely psychological, between itself and the clinical world, and it is equally certain that these psychological barriers have been to some extent broken down by the simple device of coining a new word—social medicine. If only all misunderstanding could be so easily disposed of. To the ingenious member of the Royal College of Physicians who thought of this descriptive phrase and who, therefore, took the first step to bring curative and preventive medicine together, to him are due the thanks of all our great profession. A good deal is also due to Professor Ryle, who has so wisely developed the theory of Social Pathology and so ably demonstrated the practicability of applying its teaching to the undergraduate. Ryle does not claim to have evolved the term, indeed he gives that honour to Simon who said in his 'English Sanitary Institutions'—

> "Into those other fields of endeavour as we gaze, we see numberless close analogies to our own work. We see there another Pathology than that which our clinics and dead-houses teach us, yet a Pathology almost parallel in its teachings."

Nevertheless, the development of its full meaning and possibilities is due to Ryle, and the bridging of the gulf between curative and preventive medicine, if indeed it is about to be accomplished, will be due to him more than to any other man.

In the Centennial Discourse given before the New York Academy of Medicine in 1947 and published as Chapter I in his 'Changing Disciplines', Ryle compares and contrasts social and individual pathology. Each he says

has a similar history; Bright, Addison and Hodgkin were studying disease by individual necropsy in the bodies of the dead. Farr was studying disease by social necropsy in the office of the Registrar-General, doing his little sums about human lives (of which Major Greenwood told us in his 'Pioneers of Social Medicine'), and Simon and Edwin Chadwick were conducting social surveys; each branch of pathology has developed techniques of investigation and has modified and adapted old methods; each has been supported by allied sciences, whereas individual pathology leans upon bacteriology, immunology, haematology, biochemistry, radiology, endoscopy, physiological techniques, and surgery and clinical observations, so likewise social pathology must rely upon statistics, epidemiology and social survey methods; each must observe natural and experimental studies; each must invoke the assistance of mathematics. Individual pathology takes account of quality and effects, while social pathology deals with quantity and causes; thus individual pathology sheds light upon immediate circumstances leading to death and the social necropsy upon the predisposing causes; the individual post mortem says nothing about incidence and distribution, whereas the social post mortem says much.

Ryle emphasises how greatly these two forms of pathology differ in status—

> "Human pathology, in its usually accepted sense, has acquired a status of its own in the medical faculties of all universities. Its associate sciences are commonly housed close together or even under one roof. Its numerous workers are given the opportunity to contribute to research and to the day-to-day teaching of undergraduates or graduate students. Outside a few great research institutes (I speak here of my own country) such as the London School of Hygiene and Tropical Medicine—which has served broad national and imperial needs but has had only a slender association with the life and work of the hospitals and the medical schools or with other scientific departments of the university—social pathology has, until lately, been accorded no position of its own. Its students, whether they work in the fields of public health bacteriology, or epidemiology and vital statistics, or in nutritional physiology, industrial psychology, or other subjects, have tended to do so in various places and in detachment and without the advantages of a presiding and co-ordinating discipline."

And finally, these two forms of pathology have developed along parallel rather than convergent lines and once more we are back again where we began. In general, Ryle says—

> "The newly qualified doctor embarks upon his career steeped in the ideas of individual pathology, moderately well versed in the therapeutic techniques, and with a smattering of psychology, but almost ignorant of social pathology; knowing little of the incidence of diseases and their mortalities and secular trends or of the social factors which are in part or whole responsible for their inception or continuance. His interest in the frequency and the reasons for the frequency of the more prevalent diseases and injuries—whether lethal and crippling, or crippling but not

> lethal, or of less serious type—has scarcely been awakened. The possibility of preventing them has been too little discussed with him, whether at the bedside or elsewhere. In regard to some important groups of diseases he is actually misled by terminology and his text-books. Cholera, plague, malaria, the dysenteries, leprosy, and hookworm have been classified for him as 'tropical', or, perhaps (if they have too recently been familiar nearer home), as 'sub-tropical' diseases. And yet they have all occurred and some of them have even flourished in Great Britain and European countries and the temperate zones of the Americas at a time when dirt, poverty, squalor, and malnutrition, and ignorance or neglect of sanitary laws were conspicuous among the attendant social influences. These great endemic diseases of backward populations still prevail in India, China, and Africa. Nearly all of them are pre-eminently 'social' diseases and due to alterable social causes. They are, strictly speaking, linked rather with a stage of historical development than with latitude or climate. The adjective 'tropical' (if we except diseases due to parasites and vectors which are only found in the tropics) is a misnomer. Other and more chronic diseases now prevalent in Europe and the West—peptic ulcer, cardiovascular disease, cancer, the chronic rheumatic diseases, the visceral neuroses, the psychoneuroses, and accidental injuries—also have their epidemiologies and social aetiologies, but this has not been made sufficiently apparent to the mind of the student or practitioner. And yet if a graduate, stimulated by an interest in preventive medicine, desires to enter the public health service, his training for a special diploma has directed his thought too exclusively to the study of fevers and the immediate material environment, to sanitary law and engineering, and to public health bacteriology and chemistry."

There are signs that this strange misunderstanding is to be cleared away and the unhappy dichotomy of a noble profession into two conflicting fields is to be ended; that the time is coming when we shall cease to regard clinical pathology as alien to social pathology; when students learn both; when general practitioners and specialists in all branches of medicine have an allegiance to preventive medicine equal to that which they have until now traditionally held for curative medicine; when the conflict between those who do clinical work and those who engage wholly in the preventive field will have disappeared and a new partnership will have taken its place based upon a common understanding of the two health needs of society and of the individual.

Wherefore, after so long a period of disunion, this new spirit of optimism; what then is the evidence that a new discipline is to supplement the traditional approach to medicine solely through clinical pathology in which the pathology of society is ignored; that social pathology can take its place in the curriculum of the teaching hospitals to permeate the minds and thoughts of teachers with a new outlook and a new hope. It is traditional that the teaching of medicine should be centred upon the hospital which houses the end results of the failure to prevent disease; traditional but none the less unfortunate if the fulcrum of medicine is to be shifted towards prevention. Students must be inculcated

with ideas of positive health when surrounded by sick people and with the elaborate paraphernalia of curative medicine. Some day the centre will shift from the hospital to the health centre; but not yet, and while the centre of teaching remains the hospital it is unwise to separate any form of medical teaching wholly from the hospital system. We must seek to change the atmosphere of the hospital where life still revolves around the necropsy and the microscope.

There is no doubt of the big change in outlook which has already taken place and which is clearly shown in the considered findings of committees. In 1936 the General Medical Council recommended that "throughout the whole period of study the attention of the student should be directed by his teachers to the importance of measures by which normal health may be assessed and maintained and to the principles and practice of the prevention of disease." With this incentive and within the last five years three important and independently constituted committees have heard evidence and published their solutions to the problem.

In 1943 there appeared a report of a special committee of the Royal College of Physicians (Interim Report 1943) established *"to consider the subject of social and preventive medicine and to make recommendations for its development"*; this report prescribed for the first time a new curriculum for medical students extending over the whole period of their clinical training to replace the long defunct one term's study of 'drains' to which we were all subject in our youth. The following year, 1944, saw the publication of the 'Goodenough Report' (H.M. Stationery Office) by an Interdepartmental Committee on Medical Schools officially sponsored by the Ministry of Health; in its section on social medicine this report said substantially the same as the Royal College of Physicians about a new curriculum, with some variations of emphasis on the content. Four years later the British Medical Association has entered the field with a comprehensive report on 'The Training of a Doctor' (Butterworth 1948) setting out the curriculum afresh with further shifts in emphasis. These three reports, which have so opportunely appeared together, are a notable exception to the rule that doctors do not agree. The content of the proposed new curriculum is much on the lines already accepted in Canada and the United States. Each wishes to see a general, continual and firm emphasis on prevention by all teachers throughout the whole curriculum; the Goodenough Committee wishes to see this extended into the earlier years of teaching, for example, into anatomy and physiology (page 169). An example of such a change was given by L. S. P. Davidson, Professor of Medicine, University of Edinburgh, when speaking to the 38th Scientific Meeting of the Nutrition Society (Glasgow, February 1947). He said that education in nutrition had to be the concern of all departments in all stages of the doctor's training; the final objective being "the production of family doctors who are competent to give sound advice to their patients on the role of food and the maintenance of health and in the treatment of disease." He asked, for example, that the relationship between agriculture and health, and the role of the accessory food factors and the 'essential' and 'trace' elements, should be

appropriately emphasised during the botany, chemistry, physiology and biochemistry courses, so that when the student approached his three final years of association with sick people he would be already made aware of the importance of nutrition. As part of such general preventive teaching the Committee of the Royal College of Physicians emphasises the need to transfer some traditional 'public health' subjects to the appropriate clinical teacher; to be dealt with as a part of his general clinical teaching; thus, epidemiology to the clinician and bacteriologist, the analysis of primary and contributory causes of maternal mortality to the obstetrician, infant and child mortality to the paediatrician, mental health as taught in the public health course to the psychiatrist (page 10).

Each Committee also wishes to see the full development of social medicine in relation to the individual; the study of the patient's life as a whole which may lead to the reason for the illness and be the only key to the restoration of health. Here is the place for the socio-clinical conferences in which the clinician, backed by the almoner's department, and the professor of social medicine, backed by the statistician, can paint a picture of the individual in a community setting; here is the need for instruction in the technique of social investigation. This development of training must take the student into the sphere of the almoner and out into the community where he will learn how to make case reports on the social background, such as he will later have to interpret in his work with the almoner in the out-patient department or the health centre. The Goodenough Report said "when acting as medical clerk or surgical dresser he should be required to select one or more patients and to include 'social diagnosis' in the case study of these patients in addition to the medical history." The Royal College of Physicians said "when he has been given an outline of the method of social case taking and has witnessed the procedure in operation in the almoner's office, in the out-patient department and in the tuberculosis dispensary, he should be launched on a short series of case studies."

The third general desire is to see the full development of teaching in that branch of social medicine which concerns the community; a suggested curriculum for this is given in the British Medical Association Committee's Report on 'The Training of a Doctor' (para. 345). Social medicine and social pathology, history and social causes of disease, nutritional requirements of a working population, psychological reaction of patient to environment, are to be taught in the transitional period; the second clinical year teaches the natural history of tuberculosis with medicine, maternal and infant mortality and maternity services with obstetrics, child welfare (including child guidance), the function of the school medical service with paediatrics and psychiatry, occupational mortality, morbidity, industrial diseases and medical supervision in factories as field work; the last term of the second clinical year teaches the progress of public health, the functions of a city health department, the organisation of a county health department, epidemiology of diphtheria, measles and whooping cough, the study of epidemics, water, milk, food and air as sources of infection, and the environmental health services. The Royal

College of Physicians thought it "unwise to precipitate the student into the study of preventive medicine without first giving him some idea of the conditions which in time past were detrimental to health and of the strivings of social science which ultimately brought about improvement in the conditions," and their report suggested that the first stage of the curriculum should consist of 18 to 20 hours describing the historical background of the existing health services; with a second stage consisting of a further 18 to 20 hours by the Professor of Social Medicine to weld together the practical aspects of the work which the student would undertake under the appropriate teaching head; namely, epidemiology and infectious diseases, maternity services, infant welfare and the care of young children, tuberculosis, venereal diseases, mental health, industrial medicine, health education of the individual, the school medical service and rehabilitation.

At this experimental stage it is unlikely that any curriculum will satisfy everyone; this is particularly likely to be true of statistics, for which the British Medical Association Committee (page 28) asked that ten lectures should be given during the first year of the medical student's curriculum. How this would have delighted Florence Nightingale, who so urgently pressed for this reform nearly a century ago. Major Greenwood, Professor Emeritus of Epidemiology and Vital Statistics, University of London, writing in the British Medical Journal (September 4th, 1948), warmly approves of this suggestion but asks also that there should be two or three equipped statistical departments in London to which students in rotation of small classes could be sent for informal teaching—the statistician and the student in a huddle in a corner.

All the reports call attention to the need for very close association of the teaching schools with the health departments of local authorities. The Royal College of Physicians said "this involves close co-operation with the clinical teachers and social workers on the one hand and with the medical officers of health and the various sections of their work on the other. . . . It would be an advantage if the paediatrician held an appointment under the health authority as well as the university." The Goodenough Report said "The clinical teachers concerned should be associated, as intimately as possible, with the appropriate personal health services of the area surrounding the medical school; in many cases they might with advantage work in the conduct of these services. Such associations are needed partly to facilitate the linking of these services with medical teaching, partly because of the benefits to the services, and partly because of their influence on the minds and outlook of the teachers." This gives point to the suggestions made by Dr. W. A. McIntosh, representative in Canada of the International Health Division, The Rockefeller Foundation, Toronto, speaking to the 35th annual meeting of the Canadian Public Health Association, Quebec, (mentioned in your October, 1947, number) on the need for university affiliations with health departments. The time has come when universities should adopt local health units and use them for the field training of students in medicine and for research. There is a proposal on foot to affiliate one division in the West Riding health scheme to the Leeds

University; such a development is comparable to the earlier affiliation of the medical school with the teaching hospital, by which the study of disease at the bedside supplemented realistically the medical school's lecture room and laboratory training. The local health department could play an equivalent role in preventive medicine to that of bedside teaching in curative medicine.

So much for changes in the discipline of the undergraduate; equally important is the need to change that of the graduate who seeks to equip himself for whole-time posts in preventive medicine. Ryle says in his 'Changing Disciplines' that Public Health is too much concerned with environment and too little with man and also that it takes account of only a few of man's many afflictions. This then must be the place for the fullest teaching of social pathology. The student who is to enter general practice must be concerned with individuals rather than communities. The general practitioner's need is for a full preventive outlook and a detailed knowledge of social medicine in relation to the individual; social medicine in relation to the community can never be more than an abstraction for him, whereas to the medical officer of health it must be meat and drink. The curriculum must now make the public health graduate aware of his responsibility towards 'all diseases of prevalence, including rheumatic heart disease, cancer, the psychoneuroses and accidental injuries' and he must widen his horizon from the immediate environment to include 'the whole of the economic, nutritional, occupational, educational and psychological opportunity or experience of the individual or the community.' In this teaching the professors of medicine, child health, obstetrics, psychiatry and social science should play their part with the professor of social medicine and his colleague the biostatistician. Such a diploma in social medicine, the basic qualification for all forms of public health administration, should be open only to graduates of registrar standing and should lead to full specialist status.

ABSTRACTS OF PAPERS PRESENTED AT THE SIXTEENTH ANNUAL CHRISTMAS MEETING OF THE LABORATORY SECTION, CANADIAN PUBLIC HEALTH ASSOCIATION, HOTEL LONDON, LONDON, ONTARIO DECEMBER 13-14, 1948

Nitrate Poisoning of Infants by Contaminated Drinking Water.

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NITRATE-CONTAMINATED drinking waters of rural Saskatchewan were responsible for ten recognized cases of methaemoglobinaemia in the past six months. Two of the cases proved fatal before therapy could be commenced. The lowest concentration of methaemoglobin observed to produce cyanosis was 10 per cent of the total haemoglobin. Cyanosis became severe when 20 per cent was converted and fatal in one case when 45 per cent was converted. In every case, water containing more than 75.0 parts per million of nitrates had been used in making up the infant's formula. All cases occurred in infants under three months of age.

Approximately one-third of the rural wells of Saskatchewan are inadequately protected from backseepage or barnyard contamination. A measure of the nitrate content of the well water in general is a measure of the contamination from animal and vegetable decay. Waters containing more than 10 parts per million of nitrates, certainly those containing more than 20.0 parts per million, should be regarded as unsuitable for infant feeding. A survey of over 2,000 rural well waters revealed that 31.4 per cent of them contained more than 10.0 parts per million of nitrates, 25.5 per cent contained more than 20.0 parts per million, 18.8 per cent more than 50.0 parts per million, and 5.3 per cent more than 300 parts per million. Nitrite contents were always negligible by comparison, seldom exceeding 1.0 parts per million. Of the waters examined, 19.8 per cent contained both high nitrates and coliform organisms.

The treatment of choice for the cyanosis has been either use of a safe water supply alone or, for serious cases, intravenous injection of 2 ml. of a 1 per cent solution of methylene blue as well as use of a safe water supply. Recovery with methylene blue therapy is spectacular, usually a matter of minutes, hours at most.

Enterococci as an Index of Faecal Contamination in Egg Products.

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ENTEROCOCCI have often been suggested as a measure of fæcal contamination. These organisms are present in liquid egg products, usually in smaller numbers than *E. coli* and the coliforms. However, since they are more resistant, it seemed that they might furnish a more reliable index of fæcal contamination in stored and dried egg products.

When artificially contaminated liquid egg was dried experimentally, *E. coli* were destroyed completely and over 99 per cent of the coliforms and Salmonella organisms were killed but over 40 per cent of the enterococci survived. During storage the enterococci survived fairly well at both 70 and 50° F. whereas the coliforms and Salmonella organisms decreased rapidly at both temperatures.

Examination of 162 egg powders from various sources revealed that 100 per cent contained enterococci in relatively large numbers while 26.5 per cent were negative for *E. coli* and 25.9 per cent contained less than one per gram. In egg powder, enterococci therefore seem to furnish a better index of the number of organisms of fæcal origin in the liquid egg than *E. coli* or the coliforms.

The Effect of Form Variation on Salmonella pullorum Agglutination.

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FORM VARIATION in *S. pullorum* gives rise to two antigenically different strains, viz., the standard and variant (X) strains possessing somatic antigens IX, XII_1, XII_2 ±, XII_3 and IX, XII_1, XII_2, XII_3 ± respectively. The standard form possesses a strong XII_3 antigen and a week XII_2 antigen, while the variant form possesses a strong XII_2 antigen and a weak XII_3 antigen.

Infection with either of these strains frequently incites the production of the antibody for the XII antigen concerned prior to the appearance of the other somatic antibodies, therefore the IX antigenic factor, which is common to both strains, cannot be relied upon to detect all the carriers of *S. pullorum* infection. Hence it has been necessary to use both a standard and variant antigen and conduct two agglutination tests on each sample of blood in order to control the disease. An antigen prepared by mixing the two strains is only partially agglutinated by a serum containing either the XII_2 or XII_3 antibody alone, whereas the corresponding homologous agglutination of the single strain antigen is complete. However, a mixed-strain antigen has been suitable for the whole-blood method of testing, probably because of the different physical phenomena involved.

In spite of the satisfactory results obtained since the two antigens were adopted for pullorum disease control, the double test is more costly to the producer and involves double the amount of work in the laboratory. In the search for more suitable antigen strains of *S. pullorum*, strains possessing the combined antigenic structure of standard and variant strains were developed by plating and serial selection of single colonies. Unfortunately these strains were not stable, which necessitated the examination of several colonies (at least 100) to ascertain the condition of the culture prior to antigen production. Frequent selection was necessary to maintain the antigenic balance of selected strains.

Antigenically the selected strains (IX, XII_1, XII_2, XII_3) behaved similar to the combined behaviour of both the standard (IX, XII_1, XII_2 ±, XII_3) and the variant (IX, XII_1, XII_2, XII_3 ±) antigens when tested with absorbed XII_2 and XII_3 serums. On routine comparative tests, the agglutinability of selected strains was greater than that of either the standard or variant strains, with the result that more non-pullorum reactions were encountered. Garrard, Burton and Carpenter have shown that many of the non-pullorum reactions are caused by low-grade infections with coliform and enterococcus types. They showed that the relationship involved the XII antigen and that the XII_2 antigenic factor was more prevalent than the XII_3 factor in these otherwise unrelated organisms. The antigenicity of selected strain antigen was reduced by the addition of standard strain antigen until a minimum of cross-agglutination with other genera occurred. This type of antigen is being experimentally tested in several laboratories in Canada to determine its value in the detection of birds infected with both forms of *S. pullorum*.

A single agglutination test for the detection of both forms of pullorum infection will reduce the cost of the test to the producer and decrease the labour involved in the laboratory. From a public health standpoint, a test antigen for pullorum disease should contain the complete XII antigenic factor since other antigenically related Salmonellae showing form variation which occasionally infect poultry would be more effectively controlled.

Observations on the Use of Streptomycin in Salmonella pullorum Infections in Chicks by the Oral and Intraperitoneal Routes.

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A PRELIMINARY TEST showed that crude streptomycin sulphate by mouth was not toxic for chicks in the large dosage that had to be given to obtain 10,000 micrograms per chick/day. Its efficiency was not determined owing to failure of the test culture.

Subsequent experiments were conducted with purified streptomycin. The mortality in chicks in which treatment was commenced at time of infection with 10,000 micrograms per

chick/day in the drinking water for 6 days was 15 per cent, while in the untreated group it was 57.5 per cent. Four of the survivors in each group were positive by agglutination tests at 105 days and *S. pullorum* was recovered from six.

In two experiments, treatment was not commenced until symptoms had developed in the flock. The mortality in those receiving streptomycin in the drinking water for 7 days was 78.3 per cent. In birds which received one or two daily intraperitoneal injections, equal to 10,000 micrograms per day, over the same period, the mortality was 90.4 per cent, while in the untreated group it was 85.3 per cent.

Experiences with Streptomycin in the Sanatorium.

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Of 87 cases of pulmonary tuberculosis who completed a course of streptomycin treatment at the Queen Alexandra Sanatorium, bacilli isolated from the sputum of 18.5 per cent had become more streptomycin-resistant, and required 100 micrograms or more of streptomycin per cc. in the solid culture medium used, in order to completely inhibit growth. While under treatment, a level of only about 10 micrograms per cc. can be maintained in the patient's blood serum.

Comparison of the clinical progress of patients gave the following results:

Streptomycin resistance of the bacilli from patients	Percentage of patients showing good clinical improvement
Less than 10	57
10 to 30	44
100 or over	25

Hence when a patient develops a resistance of 100 micrograms per cc. or more, his chances of making clinical improvement are only 44 per cent as good as for a patient who does not develop high streptomycin resistance. The data obtained suggest that the development of streptomycin resistance is of definite significance to the physician; that quick reports of streptomycin resistance are desirable; and that stopping streptomycin treatment may be desirable in some cases.

The Use of Egg Embryos in the Culture of Mycobacterium tuberculosis.

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The chorio-allantoic membrane of the developing chick embryo has been used as a routine culture medium for the tubercle bacillus. On the basis of two hundred specimens secured from tuberculous patients, it was proved to be fully as sensitive as the usual egg slant media. Positive results are secured in four to seven days after inoculating a ten-day embryo. Lesions are easily visible and preliminary indications are that atypical forms can be identified by the type of lesion produced.

Using a series of one hundred sputa from tuberculous patients at various stages of treatment, a comparison was made using egg slant cultures, Dubos media, chorio-allantoic membrane and yolk sac cultures. All positive egg embryo cultures were verified for virulence by animal inoculation. It was found that of the eighty-four egg cultures which were positive on either membrane or yolk sac or both, three were not proved as virulent by animal inoculation.

The procedure for inoculating egg embryos is rapid, it is relatively easy to train technicians, and it appears to be a culturing procedure of distinct value in the laboratory diagnosis of tuberculosis.

Tuberculin Production of Various Strains of Mycobacterium tuberculosis var. bovis.

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THE TUBERCULIN employed in Canada since 1908 as the sole diagnostic agent in the testing of cattle for tuberculosis is prepared from a bovine strain of tubercle bacillus identified as "110." In general the results obtained with this tuberculin have been satisfactory; as the campaign progressed, however, certain shortcomings relating to potency and specificity were noted which became progressively more disturbing when periodic retests and clinical examinations of already accredited tuberculosis-free herds were made. Evidence accumulated that some infected animals, often cases with generalized tuberculosis, occasionally do not respond to the tuberculin test while a small percentage of reactors are free of tuberculous lesions. While these occasional failures do not jeopardize seriously the ultimate success of the campaign, they nevertheless make the use of a more potent and specific tuberculin desirable. In pursuance of this goal a number of laboratory and recently isolated bovine strains of *Mycobacterium tuberculosis* were examined relative to their capacity for producing tuberculo-protein, the active principle in tuberculin. It is hoped that by the selection of cultures with high productivity some will ultimately be found which prove to be suitable for the manufacture of a tuberculin combining higher potency with desired specificity.

Of 27 laboratory strains 15 were finally adapted to the type of synthetic medium now used in the production of tuberculin; their tuberculo-protein was precipitated by trichloracetic acid, purified and recovered in form of purified protein derivative (P.P.D.). Three cultures yielded approximately three times the weight of P.P.D. given by our strain "110." Of 42 recently isolated bovine cultures of *Mycobacterium tuberculosis* only 4 had advanced sufficiently in growth luxuriance on the synthetic medium to be examined in a similar manner, one giving a yield of P.P.D. exceeding that of strain "110" four-fold.

In both above-mentioned groups of strains a close relationship existed between the reaction of the medium at harvesting and the amount of recoverable P.P.D.: acid final reactions were always accompanied by low yields, while alkalinity usually corresponded to a comparatively high yield of P.P.D.

A similar influence of the pH value at harvesting and the amount of recoverable P.P.D. was noted in cultures of *Mycobacterium paratuberculosis* and *avium*. These microorganisms reduce the pH of the medium always to a low level and generally show very small P.P.D. recoveries; the low yields can be increased, however, four- to five-fold if the cultures are adjusted to alkalinity several days before harvesting. These results suggest that a large portion of the elaborated protein may be precipitated at low pH levels and remain adherent to the bacillary bodies.

The described behaviour of acid-fast cultures may prove helpful in the selection of bovine strains of tubercle bacilli with a high content of recoverable protein and suitable in the production of an adequate tuberculin.

Two Years' Experience with Delayed Gonococcus Cultures.

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THE DETECTION of gonococci by microscopic slide examination of specimens from female patients is subject to serious limitations. Since cultural examination of specimens is definitely recognized to give superior results, the establishment of a gonococcus culture service was indicated. Consequently, a carrying medium, a coagulated-blood gelatin agar described by Hirschberg, for maintaining satisfactory viability of the gonococcus for at least 48 hours, was investigated. A preliminary comparative study of direct and delayed cultures showed that direct cultures were slightly superior to delayed cultures.

A study of 4,230 duplicate specimens, for microscopic examination and delayed culture, resulted in a decided advantage in favor of the delayed culture, culture yielding a 13 per cent positivity rate whereas the microscopic examination showed only 3 per cent positive.

The cultural examination of specimens giving doubtful results by smear examination indicated that, although the majority were indeed negative (78 per cent), an appreciable number were found to be positive (22 per cent).

Specimens from venereal disease clinics yielded a much greater proportion of positives than did those from institutions. The positivity rates obtained from those clinic specimens compare favorably with those usually obtained by direct examination of smears from male patients.

These results confirm the contention that Hirschberg's medium is a reliable carrying medium for delayed gonococcus cultures. As its efficacy is not perfect, the additional microscopic examination of smears is still desirable. The latter will detect the odd strain unable to survive or to grow on our media and will also serve as a control of the reliability of our cultural methods.

Modification of Peizer Medium for the Culture of Neisseria gonorrhoea.

L. M. BRYDSON, E. L. BARTON, A. M. MILLAR and M. C. SWANSON, *Division of Laboratories, Ontario Department of Health, Toronto.*

IN VIEW OF THE DIFFICULTY of preparing Peizer medium in small branch laboratories, and also the difficulty of obtaining horse plasma in such laboratories, an attempt was made to modify the Peizer medium for the cultivation of *N. gonorrhoea*, without losing any of the sensitivity of the original medium.

The modification of this medium is presented along with the comparison of results obtained on specimens from clinics. It is felt that the simplification of technique and availability of ingredients of this modification makes its use advantageous in smaller laboratories, without losing the sensitivity of the original Peizer medium. Also presented are comparative figures of results of cultural examinations for *N. gonorrhoea* using Peizer medium and an easily prepared dehydrated medium.

Substitution of Milk by Yeast Extract in Tryptone Glucose Beef Extract (Milk) Agar.

M. C. NIXON and L. M. BRYDSON, *Division of Laboratories, Ontario Department of Health, Toronto.*

A MODIFICATION of tryptone glucose beef extract (milk) agar by the substitution of yeast extract for skim milk is presented. The new medium has the advantages of ease of preparation, production of more and more clearly distinguishable colonies, and absence of cloudiness and precipitation.

The Frequent Isolation of a Paracolon Strain from Virus Enteritis in Mink.

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A PARACOLON STRAIN (anaerogenic) has been isolated on many occasions both from the intestine and spleen of mink succumbing to a very acute enteritis. A virus has recently been demonstrated as the primary cause. The role of the paracolon is apparently that of an important secondary invader.

The disease is characterized by muco-enteritis with intestinal casts frequently appearing in the feces.

The more important characteristic of the organism is that it grows well in most culture media.

Blood agar—slight zone of Beta hemolysis surrounds the colony.

Gelatine—not liquified.		Rhamnose	Negative
Motility	Positive	Urea	Negative
Glucose	Acid	Voges Proskauer	Negative
Maltose	Acid	Dulcite	Negative
Lactose	Acid (late)	Arabinose	Negative
Salicin	Acid (late)	Saccharose	Negative
Mannite	Negative	H_2S	Negative
Xylose	Negative	Citrate	Negative

Pathogenicity

Intraperitoneal inoculation of small quantities of a young broth culture in the guinea pig causes a fatal peritonitis. Infection has not followed oral administration.

Evidence that Bacterial Motility may not be at Random.

R. G. E. MURRAY and R. H. ELDER, *Faculty of Medicine, University of Western Ontario, London.*

THE ORGANISMS used in this study are *B. circulans*, *B. alvei* and *B. sphaericus* var. *rotans*. They are peritrichate and in fluid media seem to move at random and without polarity of the cell. In swarming on solid medium, however, the organisms band together in groups and the group has a definite polarity. Previous workers have noted that swarming units may be in the form of "bullet" colonies, usually tracing out a curved path, or of rotating colonies; in some species both are seen. In the case of the rotating units it has been noted that there is a tendency for rotation to be predominantly counter-clockwise. In this study definite figures have been obtained and, although the mechanism is obscure, they pose peculiar philosophical and biological problems.

Rotating units of the three species move predominantly in a counter-clockwise direction in the ratio 2:1, which is remarkably constant and could not be expected by chance. Since these species also produce "bullet" colonies, counts were made, recording the curves taken by these colonies. Here again the ratio was very close to 2:1 with counter-clockwise curves predominating. We suspect that in addition to a group polarity in swarming there is an unknown factor leading to this constant deflection from the ratio expected on a basis of random motion. A proof is offered that this is *not* due to the earth's rotational field.

The filamentous projections of the colonies of *B. cereus* var. *mycoides* usually describe curves and several workers have described strains which produce either clockwise or counter-clockwise curves. We have examined a number of strains of each and the ratios have been very close to 3:1 in all cases. In this case the mechanism of colony extension is different from that of the other species. So far we have not found predominantly clockwise moving strains of *B. alvei*, *B. circulans*, and *B. sphaericus* var. *rotans*, but relatively few strains have been examined.

We find, in a phenomenon which is a by-product of motility, that the curved path traced by "bullet colonies" and the direction in which a colony rotates is not determined by chance alone.

Notes on a Modified Fraser-Wigham Method for the Titration of Diphtheria Antitoxin.

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DURING THE PAST TWENTY YEARS the original method for the titration of diphtheria antitoxin has undergone certain modifications. In these notes we are presenting details of the method as used at present in the Connaught Medical Research Laboratories for the titration of diphtheria antitoxin in human blood serum.

Schick Test Reaction, Serum Antitoxin Titre and Resistance to Lethal Toxin Doses in Guinea Pigs.

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THE SCHICK TEST REACTION, serum antitoxin titre and resistance to lethal doses of diphtheria toxin in toxoided guinea pigs was studied, and the data compared with information in the literature pertaining to comparable data for humans.

It was found that the reaction to diphtheria toxoid in the guinea pig is very similar to that in the human. In humans it has been estimated that approximately 92 per cent of Schick-negative people are protected against diphtheria and in this study it was found that 88 per cent, and 93 per cent, respectively, of two separate groups of guinea pigs were protected against 13 M.L.D.'s of diphtheria toxin.

The Nephrotoxic Action of Staphylococcus Beta-Toxin.

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IN RECENT YEARS, several workers have described a nephrotoxic action of staphylococcal filtrates, which terminates in renal cortical necrosis. Rabbits, cats and dogs have been used to demonstrate this effect. Most reports agree that provided the dosage is so adjusted that the animal does not quickly succumb to the acutely lethal effects of staphylococcus alpha-toxin, degenerative changes may become perceptible microscopically within 5 to 12 hours after intravenous injection of the filtrate. Subsequently, the whole cortex becomes necrotic. Discrepant views have been expressed regarding the site of the initial lesions in the kidney, the extent and sequence of involvement of the vascular and parenchymatous components, and the pathological mechanisms leading to final complete necrosis. This lack of agreement is believed to derive chiefly from the presence of both alpha and beta toxins in the filtrates used by previous workers.

In the course of gathering further data on the pathogenicity of beta-toxin, striking changes were noted in the kidneys of cats, rabbits and pigeons killed by intravenous injection of monovalent beta-toxin. Unless possessed of circulating beta-antitoxin, the cat is particularly susceptible to this toxin, dosages of 2.0 cc. down to 0.2 cc. usually causing death in from 4 to 72 hours. The animals exhibit a symptomatology consistent with the development of acute uræmia. There is albuminuria, and later anuria, and the N.P.N. of the blood rises, sometimes to levels higher than 200 mgm. per 100 cc. The main postmortem effects noted are those of severe toxic necrosis. There is an early outpouring of albuminous exudate into the tubules and glomerular spaces. The tubular epithelium then shows increasing necrosis, while the glomerular tufts shrink and degenerate, and may eventually disappear. After about 36 hours, small particles of cortical necrosis become apparent to the naked eye. These areas extend and coalesce until the whole cortex is yellow and structureless. The rabbit exhibits similar reactions.

Degenerative changes in the arterial and arteriolar walls, noted by some workers employing filtrates containing primarily alpha-toxin, were only occasionally seen as a late effect in the experiments now reported. In the kidney of the cat and rabbit, the glomerular capillary endothelium, and to a slightly lesser degree, the tubular epithelium, appear to be especially susceptible to beta-toxin.

Purification of Scarlet Fever Toxin.

S. S. RAO and P. J. MOLONEY, *School of Hygiene, University of Toronto.*

FROM ANALYSIS OF FLOCCULES erythrogenic scarlet fever toxin has a nitrogen value per Lf of 0.00015 mg. per Lf. The toxin has been purified to the extent of 0.0002 mg. per Lf, which, on the basis of nitrogen content, represents 75 per cent pure toxin.

The Effect of Crystalline Trypsin and Chymotrypsin on Toxins, on Toxoids, and on Toxin (Toxoid)-Antitoxin Floccules.

SHANTA RAO and P. J. MOLONEY, *School of Hygiene, University of Toronto.*

THE EFFECT OF TRYPSIN and of chymotrypsin on the toxins and toxoids of diphtheria, tetanus, and scarlet fever has been studied. In addition, the problem of extracting antitoxin from toxin-antitoxin and from toxoid-antitoxin floccules has been explored.

Biochemical Study of the Bursting Factor in Clostridium perfringens.

VICTORIEN FREDETTE and GUY VINET, *Institute of Microbiology and Hygiene, University of Montreal.*

PRELIMINARY TESTS have shown that the bursting factor reported by Fredette and Frappier in 1946 is not identical with and does not contain the enzymes already known to be present in fluid cultures of *Cl. perfringens*, namely: lecithinase, hyaluronidase, collagenase and fibrinolysin.

In an attempt to isolate the bursting factor in powder form so as to study its biochemical nature more closely, two methods only have been retained. The first is precipitation by 10 volumes of 95% ethyl alcohol at room temperature; the second is based upon Boivin's method using trichloracetic acid at 10° C. This last method has permitted the preparation of a product which is 50 times more active than that obtained by alcohol.

The identification of the purified substance is being pursued.

Observations on the Problem of Oral Immunization Against Clostridium botulinum Toxin.

C. E. DOLMAN, LEONARD C. JENKINS and JUANITA E. WOOD, *Department of Bacteriology and Preventive Medicine, University of British Columbia; Connaught Medical Research Laboratories (Western Division), Vancouver.*

ATTEMPTS WERE MADE, without success, to induce active immunity against botulinus toxin in mice by oral administration of toxoid. One possible explanation for this failure was that formalinization resulted in the production of an antigenic molecule unable to resist the action of digestive enzymes. This hypothesis was pursued, and appears supported by the experimental results.

Toxic filtrates prepared from strains of *Cl. botulinum*, types A and E, were treated with 1 per cent formalin until atoxic. Portions of these toxoids were incubated at 37°C. for 24 hours, in the presence of 1 per cent pepsin at pH 1.8, and of 1.5 per cent trypsin at pH 8.5, respectively. Other portions were incubated with an equivalent added amount of physiological saline.

Groups of mice were given a series of intraperitoneal injections of the enzyme-treated toxoids at appropriate intervals, while other groups received a similar course of injections of the control toxoids. Both groups of mice were then challenged with homologous botulinus toxin. The mice which had received the salinized toxoid injections withstood 20 m.l.d. of toxin, whereas the mice given trypsinized or pepsinized toxoids failed to survive a challenge of 2 m.l.d.

Samples of botulinus toxin, from which these toxoids had been derived, were similarly exposed to pepsin and trypsin. No significant loss in potency occurred. The toxins thus apparently resisted the action of enzymes to which their derivative toxoids were susceptible.

Use of the Waring Blendor for the Dispersion of Pertussis Vaccine.

G. G. WATERS and D. R. E. MACLEOD, *Connaught Medical Research Laboratories, University of Toronto.*

HAEMOPHILUS PERTUSSIS grown in liquid synthetic media tends to grow in clumps which cannot readily be broken up by shaking. A uniform suspension of these organisms is obtained by use of the Waring Blendor.

A Study of the Incidence of Trichinosis in Rats of British Columbia.

IRVIN W. MOYNIHAN and IOLA W. MUSFELDT, *Division of Animal Pathology, Science Service, Dominion Department of Agriculture, Branch Laboratory, Pacific Area, The University of British Columbia, Vancouver, B.C.*

THIS REPORT presents the results obtained in a preliminary survey carried out to determine the incidence of infection by *Trichinella spiralis* in rats.

Two hundred and sixty rats were collected in the vicinity of Vancouver, British Columbia, from September to November, 1948. The diaphragm from each rat was examined microscopically by the compression method. One hundred and seventy-one rats originated from four piggeries, 82 rats were collected from five garbage dumps, and seven rats were from four places which included a road junction, a park, a waterfront point and a small town. Infection by *T. spiralis* was demonstrated in rats from three of the four piggeries; the percentage incidence of infection being 22.9, 20.0, and 46.5 per cent, respectively. Trichinellid larvae were also present in the diaphragmatic tissues of rats collected from three of the five garbage dumps. The incidence of infection among the rats collected from the garbage dumps ranged from 7.6 to 20.0 per cent. Tissues from rats collected elsewhere were negative.

On the whole, the intensity of infection among rats collected from piggeries was considerably greater than that found in rats from garbage dumps. However, it should be noted that a rat from a garbage dump yielded the highest single infection.

While this survey is still in the preliminary stage, the authors feel that the results are strongly indicative of a relatively high rate of infection by *T. spiralis* in rats in the vicinity of Vancouver, British Columbia.

Pathogenic Fungi Identified in the Routine Mycological Laboratory Service.

J. B. FISCHER, *Division of Laboratories, Ontario Department of Health, Toronto.*

A REPORT is presented outlining species of fungi pathogenic to man, isolated in a mycological laboratory service at the Central Laboratory of the Division of Laboratories of the Ontario Department of Health.

From January 1 to November 15, 1948, there were examined 1,160 specimens of skin scrapings, nail tissue, hair and miscellaneous specimens. Two hundred and thirty-three (20 per cent) were positive. The pathogens isolated and their frequency, as well as the tissue from which the pathogens were isolated, are given in two tables. These tables are considered in detail.

A Case of Chromblastomycosis in Ontario.

A. E. ALLIN, *Director, Regional Laboratory, Ontario Department of Health, Fort William,* and J. J. LEISHMAN, *Fort Frances, Ontario.*

REPORT OF A CASE of chromoblastomycosis or verrucous dermatitis at Fort Frances, Ontario: The patient, a 73-year-old man, first noticed a small cyst-like lesion on the dorsum of his hand about September 15, 1947. It was excised on January 23, 1948. The specimen was submitted for pathological examination and the diagnosis of chromoblastomycosis made from a study of the tissue sections. Since the material had been submitted in 10 per cent formalin, it was unsuitable for cultural studies. *Hormodendrum pedrosoi, H. compactum* and *Phialophora verrucosa* are the three recognized etiological agents of this disease which has been reported from many parts of the world. This appears to be the first report of its occurrence in Ontario.

Experimental Studies on Rabies Virus.

HILARY KOPROWSKI, *Section of Viral and Rickettsial Research, Lederle Laboratories Division, American Cyanamid Company, Pearl River, N.Y.*

A REPORT summarizing experimental studies conducted over a period of two and one-half years along the following lines: (*a*) preparation of an effective, inexpensive means for mass vaccination of dogs, which would confer lifelong immunity; (*b*) purification of brain tissue vaccines to remove the factor or factors presumably responsible for neuroparalytic accidents, and (*c*) in case the latter could not be attained, development of a substitute method to be used for rabies prophylaxis in man.

In the work on canine rabies, an attenuated strain of rabies virus was obtained which has undergone 138 chick-brain passages followed by 90 passages in developing chick embryos. This strain is apparently non-pathogenic to dogs inoculated parenterally, and at the same time it imparts a marked protective ability to dogs against challenge inoculations with street strains of rabies virus. Since it is a living virus vaccine, it is possible that lifelong immunity may be conferred, and the danger of post-vaccinal paralysis occurring in vaccinated animals is eliminated by the use of embryonic avian tissue.

The experiments to produce allergic encephalitis in guinea pigs by inoculation of brain-tissue suspensions, or by chemical fractions of brain-tissue components, together with adjuvants, were fruitless in determining the factor or factors responsible for post-vaccinal neuroparalytic accidents. A substitute for the currently employed prophylactic against rabies was found in hyperimmune antirabies serum. Experiments in hamsters, treated after inoculation with the street strain of rabies virus, indicate not only that the serum is effective in preventing the appearance of clinical signs of the disease, but also that serum protection is superior to vaccine treatment even when administered in massive doses.

Differential Diagnosis of Mumps Encephalitis by Complement-fixation.

CHRISTINE E. RICE, *Division of Animal Pathology, Science Service, Dominion Department of Agriculture (Animal Diseases Research Institute), Hull, P.Q.*

THE STUDIES of the applicability in the serologic diagnosis of viral infections of the quantitative complement-fixation methods developed by Wadsworth, Maltaner and Maltaner[1] have now been extended to mumps. In addition to indicating that the quantitative relationships in mumps virus systems appear to conform with those hitherto demonstrated in the various other antigen-antibody systems, the results support the conclusions of previous investigations that complement-fixation may be a useful tool in the differential diagnosis of mumps virus encephalitis. As has been reported by Henle and his associates,[2] titres during the acute phase of the disease were found to be higher with an extract prepared from chorio-allantoic membranes of chick embryos infected with mumps virus than with pooled allantoic fluids from the same source.

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[1]Wadsworth, A. (1946). Standard Methods of the Division of Laboratories and Research of the New York State Department of Health, Williams and Wilkins Company, Baltimore, Md., 3rd ed., pp. 361-465.

[2]Henle, G., Henle, W. and Harris, S. (1947). Proc. Soc. Exper. Biol. and Med., *64*: 290-295.

Neutralizing Antibodies Against Mouse-Adapted Lansing Strain of Poliomyelitis Virus in the Sera of Acute, Convalescent and Normal Individuals.

E. L. BARTON, N. A. LABZOFFSKY, W. G. ROSS, and L. P. MORRISSEY, *Division of Laboratories, Ontario Department of Health, Toronto.*

THE PRESENT REPORT deals with a survey of neutralizing antibodies against mouse-adapted Lansing strain of poliomyelitis virus in the sera of acute, convalescent and normal individuals during a 1946 epidemic.

Two-phase sera were tested from 35 Ontario and 9 British Columbia patients. Seventeen out of 35 Ontario patients contained in their sera neutralizing antibodies during the acute stage. In 4 of these initially sero-positive patients, there was an increase in the neutralizing titre during convalescence and in 3 patients there was a notable decrease. Sera from 6 out of 9 British Columbia patients, likewise, were capable of neutralizing the Lansing strain of virus during the acute stage. Only one patient in this group, who was sero-negative during the acute stage of illness, developed antibodies in the course of convalescence and in 2 there was a decrease in the titre during convalescence.

Seventeen out of 44, or 38.6 per cent of convalescent sera from Ontario, and 62 out of 146, or 42.4 per cent of convalescent specimens from Quebec, gave a positive neutralization reaction with the Lansing virus.

Forty-eight per cent out of a total of 100 sera from normal adults and 43 per cent out of a total of 51 sera from normal children were found to be sero-positive. Both the sera from normal adults and normal children were obtained from Quebec.

On the whole, the results obtained agree closely with the observations reported by American workers.

Properties of the First Strain of Newcastle Disease Virus Identified in Ontario.

JOHN F. CRAWLEY, *Connaught Medical Research Laboratories, University of Toronto,* and J. S. GLOVER, *Ontario Veterinary College, Guelph.*

THE FIRST STRAIN of Newcastle disease virus to be identified in Canada was isolated from 2 - 3 week old chicks which were dying of an acute infectious disease in Lambton County, Ontario.

This strain of Newcastle virus causes agglutination of the R.B.C. of chickens, dogs, guinea pigs, humans, mice and rats, but not of cattle, horses, mink, monkeys, swine, rabbits or sheep. When chicken erythrocytes were treated with this strain of virus, the cells were still agglutinable after elution by influenza virus but not mumps virus. This is in agreement with the "liniar theory" of Burnet. The addition of known Newcastle immune serum inhibited the hemagglutination phenomena.

Electron microscope pictures of the washed virus showed a body approximately 200 mμ in diameter with a tail measuring 300 mμ—sizes which are considerably larger than that reported for most strains of Newcastle virus.

The virus was highly pathogenic for young chickens, small doses causing paralysis and death within one week. The virus was re-isolated from the liver, lung, and brain, but not the spleen, of chicks dying after experimental inoculation of the first egg passage. The virus was highly pathogenic for chick embryos, killing the embryos by 72 hours and reaching concentrations up to 10^{10} infective doses per gram of infected tissue. Despite massive doses of virus, it was not possible to kill pigeons with this strain; the birds were subsequently shown to have developed neutralizing antibodies after inoculation of the virus. Similarly, the virus could not be established in mice.

This Ontario strain of Newcastle virus was neutralized by known immune serum received from Dr. Beaudette of New Jersey. As shown by chick embryo neutralization tests, 10^4 infective doses of virus were neutralized by this known serum.

In conclusion, it should be stated that the existence of Newcastle disease virus in Canada is of interest both as an animal and human disease problem. Cases of human infection were first described among laboratory workers in Australia by Burnet. More recently Dr. Howitt has demonstrated the existence of virus neutralizing antibodies in sera derived from children in Alabama and Tennessee. Some of these children showed signs of involvement of the central nervous system and others of meningo-pneumonitis. The biological similarities of Newcastle virus to the agents of human mumps and influenza are also of interest.

Canadian Journal of Public Health

FEDERAL ASSISTANCE FOR PUBLIC HEALTH RESEARCH

IT IS GRATIFYING that provision for research in all aspects of public health was made in the National Health Grants. The importance of research has long been stressed by public health leaders in every field. It has been appreciated by the Government that the answer to the further improvement of public health lies, in many instances, in intensive study and investigation. The grant for public health research provides $100,000 for the present fiscal year which terminates in March, and an amount of $200,000 for the coming year. As research facilities and trained personnel are augmented, the grant will, it is expected, be increased to $500,000 annually.

Some who were not familiar with the plans may have wondered if these research grants might be for work in fields now the subject of support by grants from the National Research Council, particularly through its Medical Division. The National Cancer Institute and, in Ontario, the Ontario Cancer Treatment and Research Foundation are also supporting medical research, primarily in the field of cancer. There is, however, no reason for any confusion, as adequate arrangements have been made by the Department of National Health and Welfare for a close liaison with the National Research Council and other research bodies. Thus overlapping will be prevented and teamwork fostered in the advancement of research in Canada. As the name implies, the public health research grant is for the purpose of furthering investigations in public health. Fundamental research studies, largely conducted in laboratories, are primarily the field of the National Research Council. Investigations of various kinds, field studies and surveys relating to preventive medicine and public health, as well as laboratory and clinical studies specifically relating to these fields, will therefore look to the public health research grant for their support. Of necessity, some studies will be borderline, and the liaison established will permit of adequate consideration.

Early in November, approval was given to ten studies and several others were deferred until further information could be supplied. Subsequently, five other studies have been approved. Support has been provided for the following investigations: role of sewage and water supplies in the spread of poliomyelitis; nutritive value of milk; effectiveness of topical applications of sodium fluoride

in the control of dental caries; vision-testing procedures in school medical services; excretory function of the skin in eclamptic toxaemia; studies of food-utensil sanitation; radio-isotopes in public health procedures; evaluation of the Wetzel Grid in school health services; rural domestic septic-tank operations; physical environment of small schools; excessive quantities of nitrates in ground waters; frequency of histoplasmosis in Quebec; control of B.C.G. scarification test; neurotropic virus infections; and morbidity in families.

This is a splendid start. It is reported by the Department of National Health and Welfare that a considerable number of additional applications for the coming year have already been received, and there is every reason to believe that the amount appropriated for public health research during the next fiscal year will be fully used. The number of applications indicates that universities and other institutions in Canada have had many valuable projects which previously could not be undertaken. Without question, the providing of public funds for the furtherance of public health research will prove to be one of Canada's best investments.

MILK CONSUMPTION IN CANADA

FOR many years public health officials have given leadership in two aspects of milk consumption: they have urged improved sanitary practices and pasteurization; they have advised increased use of milk, particularly by children. These two efforts have been partially successful in Canada but the task in neither case is completed. At present, additional factors must be considered because the present emphasis on the price of milk is having a deleterious effect upon milk consumption. Several types of misinformation supplied to the public need to be corrected.

Milk is not yet adequately safeguarded in many parts of Canada. In those areas in which pasteurization has been made compulsory, the benefits have justified the regulations. There should be no relaxation in efforts to have pasteurization of all milk used for human consumption.

From 1939 to 1946 total use of fluid milk in Canada increased about thirty per cent. Education and government subsidies were responsible for this increase. Immediately following advances in milk prices the improvement in milk consumption has been reduced by one-half. Every survey on school children carried out in the past four years indicates that a substantial number, perhaps thirty per cent, received definitely less than one pint of milk per day. The recent reductions in milk use and the failure of many children to obtain adequate amounts have been ascribed to the "high price of milk." There is good reason to believe that a leading factor has been misinformation supplied to the public and a creation of a notion in the minds of many mothers that milk is too expensive to use.

What are the facts? Since 1939 the average price of all foods has increased by about 100 per cent. Many items have more than doubled in price since the start of the war. A few foods have only increased about 50 per cent; these are:

milk, bread, and citrus fruits. These foods are cheap to-day because their retail prices have not kept pace with wage and price levels. During the period when milk consumption receded most rapidly, wages were increasing sharply, as were sales of beer, chewing gum, and cigarettes. Are mothers being informed that milk is a cheap food at present price levels? Are they being told that two quarts of milk will supply as much protein as one pound of average meat and that milk is a cheaper source of protein? Are they being told that children must have milk if they are to obtain adequate amounts of calcium and riboflavin and that it is better to spend money on milk than on sweet foods? It is the responsibility of public health personnel to see that this information is given to mothers.

Milk is not a dead issue in health activities in Canada and it cannot be so regarded until every child in Canada has at least one pint of milk a day and until all milk is made safe by pasteurization. At the present time education regarding milk needs to be intensified.

NEWS

British Columbia

A DIVISION OF PREVENTIVE DENTISTRY will be established by the B.C. Department of Health and Welfare with funds provided by the Federal Government's public health grants. One of a large number of new projects planned in the field of general public health, the new division will work toward setting up a province-wide program of dental examination, treatment in children, and education. The proposed division is to be staffed at the outset by a dentist and a dental nurse who will be responsible for organizing clinics in cooperation with health units and local health services. Wherever possible they will utilize the services of local dentists. The division will emphasize the educational aspects of preventive dentistry—nutrition, daily dental hygiene, and regular dental examinations.

DR. FRANK MCCOMBIE, L.D.S., R.C.S. ENGLAND, has been appointed to the staff of the Department of Health and Welfare to assist in the organization of the provincial dental program.

MR. NORMAN J. GOODE, B.A.Sc., has been appointed assistant public health engineer for the Province. An engineering graduate of the University of British Columbia, Mr. Goode formerly held the position of district sanitary engineer for Saskatchewan in the Public Health Engineering Division of the Department of National Health, located at Regina.

THE FEDERAL GOVERNMENT has approved an appropriation of $110,000 for the purchase of eleven x-ray units to provide chest x-rays for tuberculosis to all patients entering British Columbia hospitals. The equipment will be loaned to general hospitals so that all patients admitted may be given an x-ray check for tuberculosis. In some instances this service will also be available to out-patients. It may also be possible to lend the x-ray equipment to health units in strategic centres for community surveys. The new service is regarded by health officials not only as a valuable means of detecting tuberculosis but also as an important forward step in protecting other patients and hospital employees from unrecognized cases of the disease. Costs are being charged against the grant of $272,740 allotted to British Columbia this year out of the $3,000,000 set aside in the Federal program for tuberculosis control. Streptomycin is now being provided without charge to patients in the Provincial sanatoria.

Alberta

FUNDS FROM THE FEDERAL GOVERNMENT'S health grants will be used to equip a new public health laboratory in Calgary. The laboratory is expected to provide more prompt service for public health officers in the southern part of the province.

THE MENTAL HEALTH GUIDANCE CLINIC for Edmonton and district, established last July, will be financed with funds from the Federal Government's health grants. Designed to improve facilities for the diagnosis of nervous and mental illnesses, the new clinic goes into five rural areas monthly and three rural centres twice a month, as well as working in Edmonton. Although its staff examines, diagnoses and treats persons suffering from all types of nervous and mental illness, special attention is given to preventing maladjustments in children and to the promotion of measures to improve mental health in general. The full staff of the clinic consists of a psychiatrist, a psychologist, and two social worker-psychologists.

THE FEDERAL GOVERNMENT is contributing approximately $80,000 toward the cost of equipping the new Edmonton Sanatorium and about $23,000 for additional medical equipment at the Central Alberta Sanatorium. The funds allotted to the Edmonton institution will be spent entirely on medical and surgical equipment and supplies. When completed it will be one of the most up-to-date and best-equipped sanatoria in Canada. The funds for the Central Alberta Sanatorium will be used to equip a new clinic to provide better diagnostic facilities for tuberculosis in the Calgary district. An x-ray unit is among the equipment to be purchased.

THE COST OF EQUIPPING and operating the new health unit for Drumheller and district will be assumed by the Federal Government, with the expenses being charged against the appropriation of $287,700 allotted to Alberta this year for the promotion of general public health services. Also approved is the use of Federal funds to hire an additional nurse for the Macleod health unit.

Saskatchewan

FOUR ADDITIONAL NURSES may be added to the Saskatoon City Health Department, dental services for pre-school children will be increased, and a new well-baby clinic will be established on the outskirts of the city with funds from the Federal Government health grants. The four additional nurses will work toward the prevention of disease and the improvement of health standards by assisting in the well-baby clinic, in immunization programs, in the dental clinic, in controlling communicable diseases including tuberculosis and venereal disease, and by home visits. Funds have been set aside to provide salary and equipment for a second dentist to work among pre-school children. At present between 60 and 70 pre-school children are seen each month, and it is hoped that with an extra dentist on the staff this number may be doubled. Among the equipment to be purchased is a dental x-ray machine which will provide a service not available heretofore.

Manitoba

THE DAUPHIN HEALTH AND WELFARE CENTRE was officially opened on January 13 by the Hon. Ivan Schultz, Minister of Health and Public Welfare for Manitoba. Housing the local health unit, district welfare offices and complete diagnostic facilities, the Dauphin centre is the first of its kind to be built in Canada. The new unit was built and equipped by the provincial government at a cost of $100,000. A full program of preventive medical services is carried on by the local health unit staff. The major part of their work consists of school health programs, well-baby clinics, and sanitation. More than 900 cases are currently being handled by the Dauphin Welfare Department under the direction of F. C. Pormoli, district welfare inspector. Diagnostic facilities in the centre include a $10,000 x-ray machine and well-equipped bacteriological and pathological laboratories. These facilities are at the disposal of physicians in Dauphin and will provide prepaid diagnostic services to the 15,000 people in the area. Guest speakers at the official opening included Miss Elizabeth Russell, Director of Nursing for the Province, who in 1917 was the first public health nurse in Dauphin; Mayor W. L. Bullmore of Dauphin, Reeve J. Potoski of Dauphin municipality, Mr. J. Gardner, Dr. R. M. Creighton, director of the local health unit, and Mr. K. O. MacKenzie, director of welfare services for the Province. Mr. J. E. Ramsden, chairman of the local health unit board, presided at the ceremony and more than three hundred citizens were present to inspect the new unit.

GILBERT PLAINS MEDICAL NURSING UNIT was officially opened on January 14 by the Hon. Ivan Schultz, Minister of Health and Public Welfare. Built at a cost of $55,000, the new unit contains 10 beds, an emergency operating room, a maternity case room, doctors' offices, and living quarters for four graduate nurses. The unit was built almost entirely by district workmen, and was furnished and equipped by local organizations. Each room contains a radio, and was furnished at a cost of $750. The unit will serve approximately 4,000 people in the municipality and town of Gilbert Plains. To date, $18,000, representing three-quarters of the total grant, has been contributed by the Federal Government under the hospital construction grant. The remainder will be paid when the unit is completed.

Ontario

PLANS TO ASSIST PATIENTS discharged from tuberculosis sanatoria in Ontario to become self-supporting more quickly have been approved under the Federal health program. A director of rehabilitation and four placement officers will be appointed. The director will establish a rehabilitation division and organize training facilities within sanatoria. The training will be designed to teach the patients new skills or to develop latent ones which will enable them to become self-supporting after their discharge. The four placement officers, to be stationed in various parts of the province, will be responsible for finding suitable work for the discharged patients.

STAFF FOR THE WOODEDEN HOSPITAL SCHOOL, near London, will be given special training with the aid of money from the national health grants for work among crippled children. The plans call for the opening of Woodeden as a year-round centre exclusively for the treatment of children with cerebral palsy. Up to now it has operated for thirteen weeks each summer as a camp for children suffering from various crippling diseases. The personnel to be trained include two physiotherapists, an occupational therapist, a nurse, and a social worker. The medical

director of the centre will be Dr. T. H. Coffey, professor of physical medicine at the University of Western Ontario.

THE THIRTEENTH ANNUAL CONVENTION of the Canadian Laboratory Technologists will be held at the Chateau Laurier in Ottawa on May 20 and 21. An invitation to attend is extended to all those interested. Further information can be obtained from Miss Isabelle Mailhiot, 217 Besserer Street, Ottawa.

DR. W. P. EARLE, D.P.H., formerly assistant medical officer of health of the Leeds and Grenville Health Unit, has been appointed assistant medical officer in the Simcoe County Health Unit.

DR. J. E. BARNARD resigned as assistant medical officer of health in the Porcupine Health Unit on September 30. He is now attached to the Division of Industrial Hygiene of the Provincial Department of Health.

SOME FORTY MEDICAL OFFICERS of health and thirty supervisors of public health nursing attended a conference held in Toronto on January 10, 11 and 12. Those in attendance represented the full-time public health services now in operation, and the municipalities and health units throughout Ontario.

Quebec

EXTENSION OF THE DIAGNOSIS and treatment of cancer and further research into its causes will be undertaken by the Radium Institute and the Cancer Institute of Montreal, through support from the Federal health grants. When the Cancer Institute is fully in operation, it will have four sections. The medical section will be devoted to preventive work among the public, diagnosis of cancer for both out-patients and in-patients, treatment through x-rays, radium and surgery, and research. The latter program will involve laboratory studies in nutrition, virology, biological and physical chemistry, pathology and hormonology, as well as clinical observations. The social service division will be expanded, and an educational section will be set up to inform the public about the latest developments in the control of this disease and to keep the medical profession abreast of the newest techniques in prevention, diagnosis and treatment.

THE LAFLECHE HOSPITAL, at Grand'Mère, is the first hospital in Quebec to be assisted in its construction by a Federal grant since the national health plan was announced last year. Payments will be made to the Laflèche Hospital as building progresses, with the total federal contribution amounting to about $116,000. The grants for hospital construction are among the few under the national health plan which must be matched dollar for dollar by the provincial government. The Grand'-Mère hospital is being built by La Congrégation des Filles de Jesus de Trois Rivières to serve an area having a population of about 90,000. It will have 120 beds and will be fully equipped with x-ray, laboratory and surgical equipment to handle general medical and surgical cases. Begun in May, 1947, it is now 25 per cent completed and is expected to be finished by next December. The total allocation for hospital construction in Quebec this year is more than $3,840,000.

TO INCREASE THE NUMBER of professionally trained persons for hospital service, federal funds have been allotted for support of the Montreal School for Nurses Aides. The school prepares aides to assist nurses in the care of non-acutely ill, chronically ill or convalescent patients. Sponsored by the Association of Nurses of the Province of Quebec and the Montreal Hospital Council, the course is given at the Montreal Convalescent Hospital under the auspices of the Herbert Reddy Memorial Hospital, the Montreal Convalescent Hospital, the Homeopathic Hospital of Montreal, the Montreal General Hospital, the Jewish General Hospital, and St. Mary's Hospital. During the first six months of the course the students receive classroom instruction and supervised practice. During the second six months they are salaried employees of the hospitals.

THE FEDERAL GOVERNMENT will contribute more than $50,000 from the national health grants to equip laboratories for research in respiratory diseases at the new St. Joseph Sanatorium in Montreal. The laboratories will be of major assistance in the diagnosis and treatment not only of tuberculosis but also of other respiratory diseases such as bronchial infections, lung abscesses, silicosis, cancer of the lung, and asbestosis. The attention to be given to respiratory diseases in industry is expected to be of special value to persons employed in Quebec's large industrial developments.

MEDICAL SERVICES in Quebec's Protestant schools will be extended and improved through funds from the federal health grants. The proposed new service will supplement what

is now partially provided through health units and will begin with a doctor, a dentist, and two nurses. Funds have been earmarked to purchase mobile equipment for the dental service, and a nurse has already been obtained to work for the Richmond-Drummond-Arthabaska County Central School Board. The service will ultimately extend to more than 24,000 pupils and a thousand teachers outside Montreal and will provide health services for Quebec's Protestant schools equal to those already organized for the Catholic schools of the province.

DR. LEONCE GAUDREAULT has been appointed medical health officer of the new county health unit of Témiscouata, which has been formed by the separation of this county from Rivière-du-Loup.

DR. JEAN PHANEUF has been appointed medical officer of health for the county health unit of Wolfe, with headquarters in Weedon.

FOURTEEN ADDITIONAL NURSES have been appointed in various county health units.

DR. D. C. BEWS, D.P.H., an associate professor in the faculty of medicine at McGill University, has been appointed assistant medical director of The Bell Telephone Company of Canada and will assist in the co-ordination of health services in the company's eastern area. A native of Kingston, Ont., and a graduate in medicine of Queen's University, Dr. Bews also completed post-graduate studies in public health at the University of Toronto and in tropical medicine at McGill University.

A PAMPHLET which describes the advanced clinical courses in psychiatric, obstetrical, and paediatric nursing offered by the School for Graduate Nurses, McGill University, is available for distribution to schools of nursing, hospitals, public health organizations, nurse placement bureaux, and provincial nurses' associations. The leaflet could serve as a means of vocational guidance to student nurses in their senior year, or to nurses already employed. Copies may be obtained from the Secretary, School for Graduate Nurses, 1266 Pine Avenue West, Montreal, P.Q.

New Brunswick

SEVERAL NEW BRUNSWICK public health workers will be given additional training under the Federal Government's health plan. A radiologist is being trained for the Hotel-Dieu Hospital, Edmundston, through a two-year course at the Montreal General Hospital, and this is expected to result in improved x-ray diagnostic work in north-eastern New Brunswick. Dr. R. Allanach is receiving post-graduate training in public health at the School of Hygiene, University of Toronto, and a registered nurse is taking post-graduate training in public health at the same university. Another registered nurse is taking a course in supervision in public health nursing at the School for Graduate Nurses, McGill University, and upon completion of her course she is expected to initiate a nursing service and a health teaching program at the Provincial Teachers College, Fredericton. Two scholarships are also being provided to permit two nurses to take post-graduate training in public health at McGill University.

THE SERVICES of the provincial hospital for the mentally ill at Fairville will be extended by the purchase of equipment and the employment of a psychologist, both to be financed from the national health grants. Obtaining the services of a psychologist is the first step the province is taking in beginning a mental health service apart from the mental hospital. This psychologist, who is bilingual, will be employed on preventive work in a mental health clinic that will be opened as soon as the other necessary clinic personnel can be obtained. For the immediate present he will assist in the health survey which is part of the preliminary work being undertaken by the province in the setting up of a mental health division.

Nova Scotia

A DETAILED SURVEY of the existing health facilities in Nova Scotia is to be undertaken with the aid of federal funds. Public health services will be reviewed and any necessary recommendations will be made to co-ordinate these services with medical nursing needs. The nursing picture in the province will be studied especially in relation to the training of nurses and the means of alleviating the present shortage of nursing personnel. Hospital needs are to be studied from the standpoint of overall requirements. A study of the problems of cancer control will form part of the survey, and it is also proposed to review the venereal disease control program, the tuberculosis control program and the dental program and, in general, to assess the present overall health program in the province and to plan for any necessary improvements. The chairman of the basic health survey

committee is the Hon. L. D. Currie, Minister of Public Health, and others on the committee are Dr. P. S. Campbell, Deputy Minister of Public Health; Dr. J. S. Robertson, Assistant Deputy Minister; Dr. J. J. MacRitchie, Inspector of Penal and Humane Institutions; Miss M. E. MacKenzie, R.N., Superintendent of Public Health Nurses; Dr. D. J. Mackenzie, Director of Laboratories; Dr. C. Marshall, Chief, Division of Neuro-psychiatry; Dr. A. R. Morton, Commissioner of Health, City of Halifax; Dr. R. D. Howland, economist with the Nova Scotia Research Foundation; and Mr. G. Gregoire, accountant, Department of Public Health. An advisory committee has also been set up, and it includes representatives of medical, nursing, dental and hospital associations, labour organizations, management, universities, and union of municipalities.

TWO CLINICS for the prevention of mental illness will be established in Sydney and Yarmouth with the aid of funds from the national health grants. The clinics will stress prevention of mental illnesses through the establishment of child-guidance clinics and by co-operation with schools, courts, social agencies and other community-service organizations. The new clinics will provide consultative services to local physicians for the diagnosis and prevention of mental illness. When fully in operation, each clinic will be staffed by a psychiatrist, a psychologist, and a social worker.

Prince Edward Island

ESTABLISHMENT OF eight small branch laboratories in Prince Edward Island's general and provincial hospitals has been approved under the terms of the national health plan. When the laboratories are fully established, free laboratory service will be provided in all hospitals. The proposed network of laboratories will be a new service for smaller hospitals and is expected to result in speedier service to patients and their doctors. The present central laboratory will be retained as a standard of reference for the new establishments. Each laboratory will be manned by a technician. In addition to clinical or diagnostic requirements of the particular hospital, the laboratory will take care of the public health laboratory work for that district.

A SENIOR MEMBER of the vital statistics branch of the Health and Welfare Department will take a special course of training in advanced statistical methods and procedures, under the national health plan. Through special arrangement with the Dominion Statistician the course, which will last from two to three months, will be taken at the Dominion Bureau of Statistics, Ottawa.

BOOKS

Health Reform in New Zealand. By Douglas Robb, M.D., Ch.M., F.R.C.S. (Eng.), F.R.A.C.S. Whitcombe & Tombs Ltd., Auckland. Canadian agents: The Ryerson Press, Toronto. $1.50.

THIS LITTLE BOOK of only 103 small pages is referred to here for the sole reason that it is considered eminently worthy of being brought to the attention of all readers of this Journal, and to a wider field. It is not the product of some visionary, unrealistic planner, or a political propagandist. It is a very brief, factual review and objective analysis of the development and operation of the National Health Services Scheme of New Zealand by a practising member of the medical profession. It shows clearly good and bad features of the Bill as they are found to be in five years of its operation.

The viewpoint from which the author writes "seeks to identify itself with the welfare of the people and the progress of the beneficent art of medicine. It is informed by twenty-nine years of the study and practice of medicine, both in Britain and New Zealand—the last nineteen as a general and thoracic surgeon—but it does not identify itself with the views of any organized professional group. Likewise party politics play no part in it. . . . Health services are not a suitable subject for action in the party political field. They are matters which concern the people—individually and collectively —too intimately to be treated so."

Referring to the original Social Security Bill in New Zealand in 1938, Dr. Robb says, "There is no doubt that the Bill was political in its conception, and that technical and professional considerations were almost entirely ignored." In the development of the fuller medical benefits under the Bill negotiations between the Government and the New Zealand Branch of the British Medical Association were not always fruitful but certain compromises were reached. "Full credit," the author says, "must be given to the Labour Government for being the first in New Zealand and in the Empire to establish the principle of the public responsibility for all health services, and to formulate a universal free service based on the special Social Security Tax. Whatever we think of the quality of the service, the principle is established and seems to be disputed seriously by no one. . . . The impetus was a political one, and the conception of the details of the service also was almost 100% political—few medical men appear to have been consulted as such. The officials of the Health Department deny to this day any share in the paternity, and the profession as organized has been against almost everything that has been done, though it has come to accept a good deal of it with some satisfaction. This underlying conflict, which has not yet been resolved, is the cause of the many obvious defects and failures of the service, whether looked at from the point of view of the ordinary citizen or from that of the progress of medicine." These defects and failures might have been obviated if the Bill had been spared the political handicap in its development. "It might be said that unless the political action had been taken in New Zealand, the professional side would never have made a move. There is some truth in that, but it is not the whole truth."

Dr. Robb's analysis of the costs reveals for us some striking and instructive facts, as does his analysis of the effect of the Act on the quality and quantity of medical, hospital and ancillary services.

A considerable portion of this little book is devoted to a very timely discussion of General Practice, Group Practice, Specialist Practice, Hospitals, Nursing, Medical Education and the Curriculum. Here highly important considerations, the product of much serious thought, are crystallized in a comparatively few words.

The author concludes that the whole question of medical service, including nursing, hospitals, medical training and the relationship of medicine to other fields, should be submitted to a competent commission which could gather sound and pertinent material from all quarters and, by study of all its aspects, bring in a report with a view to workable plans for the future.

When one puts this little book down (to refer to it again, of course) one feels confident that it is the product of a medical statesman—not a medical politician; that he is fair in his review, analysis and criticism; that he has the welfare of the people and of the profession at heart; and that his knowledge and understanding of the subject are such as would only be found in one of the highest

professional calibre. This book should be read by all members of the profession, including nurses; it should be read by the public because it is they who corrupt politicians with power.

N. E. McKinnon

Basic Facts of Health Education. London: The Pharmaceutical Press, 17 Bloomsbury Square, W.C.1, 1948. 7s. 10d. by mail.

THIS little book is a selection of articles from the British Ministry of Health Bulletins published in "The Pharmaceutical Journal" between 1944 and 1947. In the introduction Sir Wilson Jameson explains their purpose: to enable druggists to keep in touch with matters of general health interest, about which they might be consulted by the public.

Some articles go farther than this, recognizing that druggists frequently prescribe for ailments "over the counter," and probably will continue to do so as long as the patient must pay a fee each time he consults a doctor. The notes on constipation remedies, cough mixtures, and minor injuries are in this group.

There are 52 articles in all, each taking from 2 to 6 minutes to read. The index of authors reads like a "Who's Who" of consultants and administrators for the Ministry of Health, but there are some notable exceptions: e.g., E. T. Conybeare discussing rheumatism, R. Rowden Foote on varicose veins, Stephen Taylor on morbidity studies, and R. A. Kekwick of the Lister Institute describing human plasma fractionation.

Two-thirds of the subjects are orthodox public health topics, notably communicable diseases. The remainder cover clinical, therapeutic, administrative and medical-social problems. About half the articles are too technical to offer the general public, Most of them would be useful to pharmacists. nurses, teachers and others who now help the physician "to extract the essentials from text-book knowledge of matters affecting human health and happiness, and make them available and attractive to all."

G. H. M. Hatcher

BOOKS RECEIVED

Bergey's Manual of Determinative Bacteriology. By Robert S. Breed, E. G. D. Murray, and A. Parker Hitchens. Baltimore: The Williams & Wilkins Company, 1948. Canadian agents: The University of Toronto Press, Toronto. 1529 pages. $15.00.

Rheology in Relation to Pharmacy and Medicine. By G. W. Scott Blair, M.A., D.Sc., F.R.I.C., F.Inst.P. London: The Pharmaceutical Press, 17 Bloomsbury Square, W.C.1, 1948. 20 pages. 2s. post free.

Essentials of Public Health. By William P. Shepard, B.S., M.D., M.A., with the collaboration of Charles Edward Smith, M.D., D.P.H., Rodney Rau Beard, M.D., M.P.H., and Leon Benedict Reynolds, A.B., Sc.D. Philadelphia, London and Montreal: J. B. Lippincott Company, 1948. 600 pages. $6.00.

Public Health Engineering. A textbook of the principles of environmental sanitation. Volume I: Part One, The Air Contact; Part Two, The Water Contact. By Earle B. Phelps. New York: John Wiley & Sons Inc., 1948. London: Chapman & Hall, Ltd. 655 pages. $7.50.

Nursing for the Future. A report prepared for the National Nursing Council by Esther Lucile Brown, Ph.D. New York: Russell Sage Foundation, 1948. 198 pages. $2.00.

Practical Food Inspection. Vol. II—Fish, Poultry and Other Foods. By C. R. A. Martin, M.R.San.I., A.M.I.S.E. London: H. K. Lewis & Co. Ltd., 136 Gower Street, W.C.1, 1948. 284 pages. 18s. net.

The Rehabilitation of the Patient. Social case work in medicine. By Caroline H. Elledge. Philadelphia, London and Montreal: J. B. Lippincott Company, 1948. $3.00.

The British Pharmacopoeia, 1948. Published under the direction of the General Council of Medical Education and Registration of the United Kingdom. Published for the Council by Constable & Co. Ltd., 10/12 Orange Street, Leicester Square, W.C.2, 1948. 914 pages. Price not stated.